ATIA - 21(1)(a)
ATIA - 21(1)(b)
ATIA-24(1)

Mitchell2, Lisa (INFC)

From: David Morley <dmorley@cib-bic.ca>
Sent: May 17, 2019 7:21 PM
To: Campbell, Glenn (INFC); Mitchell2, Lisa (INFC)
Subject: Fwd: Mapleton Water
Attachments: Mapleton Briefing Memo v4b.docx

Hi to you both.

This note / update is intended to ensure everyone is aware of the status and next steps. [redacted] and it's good for us all to have up to date information.

[redacted]

Let's keep the lines open on this and other things.

Have a Good Friday night!

Dm

Get Outlook for iOS

From: Pierre Lavallée <plavallee@cib-bic.ca>
Sent: Friday, May 17, 2019 5:31 PM
To: Gillis, Kelly (INFC); Pickerill, Joseph (INFC)
Cc: Nick Hann; David Morley; Sashen Guneratna; Lindsay Caldwell
Subject: Mapleton Water

Kelly and Joe,

Following-up on our discussion earlier today, I am attaching a short document as background, should it be required down the road.

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[redacted]

ATIA - 21(1)(b)
ATIA-24(1)

As the document says, this is still subject to Board approval and we don't expect an announcement until late June (with the issuance of the RFP document), but better to be prepared.

Have a good long week-end.

Pierre

Pierre Lavallée
President & CEO | Président-directeur général

T : +1 416 551 5245
E : plavallee@cib-bic.ca

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PROJECT BRIEFING MEMO

TO: Infrastructure Canada ("INFC")

FROM: Canada Infrastructure Bank ("CIB")

SUBJECT: **Ontario Municipal Water – Township of Mapleton**

DATE: May 15, 2019

Purpose

The purpose of this memorandum is to provide an update on the CIB's engagement with the Corporation of the Township of Mapleton ("Mapleton" or the "Municipality") for investment in expanded Water and Wastewater Services (the "Project"). The Project is being initiated and sponsored by Mapleton under the authority of Mapleton's Council.

[redacted]

The CIB is in due diligence for a proposed senior debt commitment of up to $20 million in the Project. There are a number of immediate next steps and approvals that could lead to the CIB making a commitment to Mapleton where Mapleton would release a Request for Proposals ("RFP") which would include the CIB senior debt commitment by the end of June 2019.

Project Description and Water Sector Overview

Mapleton is seeking a private sector partner (the "Concessionaire") to enter into a 20-year Concession Agreement to design, build, finance, operate and maintain ("DBFOM") the Municipality's new and existing water and wastewater infrastructure. Mapleton is in the Province of Ontario (approximately 28 km south of London) and supports a mostly rural population of approximately 11,000 residents. Mapleton will continue to own all existing and new infrastructure assets.

Mapleton is pursuing a DBFOM structure as it has some immediate infrastructure investment needs such as increasing the Municipality's water tower storage and expanding the capacity of the existing wastewater plant. [redacted] Under both the existing structure (cash basis) and proposed structure (DBFOM) Mapleton is responsible for setting rates. The proposed CIB senior debt facility provides Mapleton with low cost financing and predictability over the 20-years to allow Mapleton to better manage sudden rate increases.

Water and wastewater projects have been prioritized in the Government of Canada's Investing in Canada Plan and the Pan-Canadian Framework for Clean Climate Change.

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The CIB believes that a number of municipal water and wastewater projects exists across the country, as the 2016 Canada Infrastructure Report Card estimated that more than $50 billion of assets in the sector are in poor or very poor condition. [redacted]

Project Status

On April 2, 2019, Mapleton Council passed a motion to launch the Request for Qualifications ("RFQ") process for the Project. On April 3, 2019, Mapleton issued the RFQ and has since received five responses from reputable entities in the water and wastewater sector. Mapleton expects to short list three or four proponents who will receive the RFP in late June 2019. Mapleton is being advised by Borden Ladner Gervais ("BLG")(Legal) and PricewaterhouseCoopers ("PwC") (Financial). [redacted]

Proposed CIB Product

[redacted]

The CIB is proposing to size the Credit Facility up to $20 million [redacted]

The CIB understands that some of the RFQ respondents are publicly owned. [redacted]

Rationale for CIB Involvement

[redacted]

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are withheld
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of the *Access to Information Act*

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de la *loi sur l'accès à l'information*

Timeline and Next Steps

The timeline, including key CIB activities, is as follows:

Timeline	
April 3, 2019	▪ Request for Qualifications released
[redacted]	
April 30, 2019	▪ Submissions for RFQ Due
May 13, 2019	▪ CIB and Mapleton sign NDA
May 22, 2019	▪ CIB presentation to Mapleton (in-camera)
May 31, 2019	▪ CIB Board Approval
Early June 2019	▪ Mapleton develop communications and stakeholder management plan in advance of RFP
Late June 2019	▪ Mapleton Council motion regarding CIB participation ▪ PwC to publish a report a report outlining: (i) a preliminary business case for the Municipality's infrastructure need; and (ii) rationale for private sector involvement
Late June 2019	▪ RFP is released including CIB Credit Facility term sheet
Late June 2019	▪ CIB and Mapleton news release regarding RFP including CIB commitment up to $20m
Fall / Winter 2019	[redacted]
Winter 2019/2020	

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Summary of Mapleton RFQ

Scope

(i) Provide water and wastewater services to Mapleton that are currently performed by or under the control of Mapleton, excluding rate-setting and rate making,

(ii) Design, build and finance new water and wastewater infrastructure for Mapleton (estimated capital requirements are between $15 million and $30 million over the next 20 years), subject to approval by Mapleton's Council, ("New Infrastructure"), and

(iii) Operate, maintain and finance all operation and maintenance costs (the "O&M Services") associated with existing water and wastewater infrastructure and New Infrastructure over the term of and upon the expiration of an existing services agreement between the Ontario Clean Water Agency and Mapleton dated January 1, 2014 (the "Existing Services Agreement").

Mapleton's specific objectives:

- Mapleton's Council will act as regulatory authority in terms of establishing water and wastewater rates, considering and approving all New Infrastructure capital expenditures as required, enforcing reliability, service quality and other performance measures. In exchange, the Preferred Proponent will be provided with the opportunity to earn a rate of return on the notional rate base comprising the Mapleton water/wastewater system.

- The engagement of a reputable and experienced Preferred Proponent for the duration of the 20 year term;

- New Infrastructure for which Mapleton may not have the financial, technical or operational capacity or expertise;

- Minimize the burden on Mapleton's taxpayers with respect to the financing of New Infrastructure;

- Mitigate the risk of immediate, unpredictable and large spikes in water/wastewater rates to finance New Infrastructure.

- Mapleton considers a 60/40 debt/equity ratio to be the appropriate notional capital structure with respect to the Project and the allowed return on equity to be comparable with that of other regulated monopoly utilities, such as electricity distribution);

- To maintain Mapleton's existing municipal borrowing capacity for other municipal priorities over the long term and not to impair, reduce or otherwise affect Mapleton's municipal borrowing capacity in any way in connection with the Project;

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- To assure the residents of Mapleton that the existing infrastructure and New Infrastructure will remain at all times under public ownership by Mapleton during the 20 year term of the Project that Mapleton's Council, over the term, will continue to approve water and wastewater rates, development charges and other related tariffs;

- To provide for stable, long-term development and availability of safe and reliable water and wastewater service throughout the term of the Project Documentation compliant with all relevant legislative requirements;

- To achieve efficiencies which may include reducing pollution, mitigating other adverse environmental impacts, realizing energy conservation related to the existing infrastructure and New Infrastructure;

- Achieve water system service levels that are at least comparable to and potentially greater than service quality and reliability levels currently enjoyed at this time;

- Work cooperatively and productively with Mapleton's economic development department and planning department with respect to the deployment of New Infrastructure and operation of the water system generally; and

- Explore opportunities for additional investment or other economic benefits offered by Prequalified Parties

Assessment

- Parties must achieve a minimum aggregate score of 70% across all categories and in addition parties are required to achieve a minimum of 70% score for the criterion "Relevant Experience with Water/Wastewater Systems" :

Criteria	Criteria Weighting
Relevant Experience with Water/Wastewater Systems	30
Team Qualifications	25
Experience Operating a Regulated Monopoly Service	20
Financial Capacity	15
Commercial References	10

Timetable

1. RFQ document made available to parties April 3, 2019

2. Submission of Qualification Submissions April 30, 2019

3. Review of Qualification Submissions May 2019

4. Announcements to Prequalified Parties By May 24, 2019

ATIA - 21(1)(a) ATIA-24(1)
ATIA - 21(1)(b)

Mitchell2, Lisa (INFC)

From: Mitchell2, Lisa (INFC)
Sent: May 24, 2019 3:16 PM
To: 'David Morley'; Campbell, Glenn (INFC); 'Nick Hann'
Cc: Kokhanova, Milla (INFC)
Subject: RE: Mapleton Water

David/Nick,

Thank you for sharing the note, this is as we are keen to learn and better understand the opportunities.

I have some follow up questions based on what you have provided, that I am hoping we can get further information/clarification on. [redacted]

A few other matters we would like to better understand are below:

[redacted]

Thanks to you both in advance, I look forward to receiving more information.

As always, I am happy to discuss.
-L

From: David Morley [mailto:dmorley@cib-bic.ca]
Sent: May 17, 2019 7:21 PM
To: Campbell, Glenn (INFC) <glenn.campbell@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: Fwd: Mapleton Water

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[redacted]

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Have a Good Friday night!

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From: Pierre Lavallée <plavallee@cib-bic.ca>

Sent: Friday, May 17, 2019 5:31 PM

To: Gillis, Kelly (INFC); Pickerill, Joseph (INFC)

Cc: Nick Hann; David Morley; Sashen Guneratna; Lindsay Caldwell

Subject: Mapleton Water

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[redacted]

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Have a good long week-end.

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Pierre

Pierre Lavallée

President & CEO | Président-directeur général

T : +1 416 551 5245

E : plavallee@cib-bic.ca



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ATIA - 16(2)

Mitchell2, Lisa (INFC)

From: Lindsay Caldwell <lcaldwell@cib-bic.ca>
Sent: May 28, 2019 10:45 AM
To: Mitchell2, Lisa (INFC); Kokhanova, Milla (INFC)
Cc: Sashen Guneratna; Pranav Shah; Jeffrey To; Kunwar Singh; Olivia Nguyen
Subject: Mapleton Follow Up
Attachments: Rate Comparison.xlsx

Hi Lisa,

As discussed on our call yesterday, please find attached the back of the envelope calculations we have done to estimate the potential benefits of a CIB loan to the Mapleton project.

Please let us know if you have any questions.

Best,

Lindsay

Lindsay Caldwell, [redacted]
Director, Investments | directrice, Investissement
Office: 416 847-7727
Cell: [redacted]
Email: lcaldwell@cib-bic.ca

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ATIA-24(1) ATIA - 21(1)(b)

Mitchell2, Lisa (INFC)

From: Lindsay Caldwell <lcaldwell@cib-bic.ca>
Sent: June 3, 2019 2:31 PM
To: Mitchell2, Lisa (INFC); Kokhanova, Milla (INFC)
Cc: Sashen Guneratna; Pranav Shah; Jeffrey To; Kunwar Singh; Olivia Nguyen; Suffel, Jordan (INFC); Jiang, Yi (INFC); Khan, Irmeen (INFC); Bowlby, Mark (INFC)
Subject: RE: Mapleton Follow Up
Attachments: Water-Wastewater-Sector-Study.pdf

Hi Lisa,

I hope you had a great weekend. Thank you for your email last week. It was very helpful to hear your perspective on the project [redacted] We have spent some time considering these comments and hope we can provide further comfort on the project based on our responses below.

[redacted]

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[redacted]

Please let us know if you have any further questions.

Best,

Lindsay

From: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Sent: May 30, 2019 3:40 PM
To: Lindsay Caldwell <lcaldwell@cib-bic.ca>; Kokhanova, Milla (INFC) <milla.kokhanova@canada.ca>
Cc: Sashen Guneratna <sguneratna@cib-bic.ca>; Pranav Shah <pshah@cib-bic.ca>; Jeffrey To <jto@cib-bic.ca>; Kunwar Singh <ksingh@cib-bic.ca>; Olivia Nguyen <onguyen@cib-bic.ca>; Suffel, Jordan (INFC) <jordan.suffel@canada.ca>; Jiang, Yi (INFC) <yi.jiang@canada.ca>; Khan, Irmeen (INFC) <irmeen.khan@canada.ca>; Bowlby, Mark (INFC) <mark.bowlby@canada.ca>
Subject: RE: Mapleton Follow Up

Lindsay/Sashen,

Thank you very much for the follow up. The team and I very much appreciated you taking the time to walk us through in more detail, what the Mapleton deal looks like. Our notes from the meeting are below.

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[redacted]

Thanks, and again, we appreciate you taking the time.[redacted]

Additionally, if you have any changes to our meeting notes below, please let us know.

Thanks,
-Lisa

Meeting Notes – Monday, May 27, 2019

[redacted]

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[redacted]

Lisa Mitchell

Senior Director, Investment, Partnerships and Innovation
Infrastructure Canada / Government of Canada
lisa.mitchell2@canada.ca / Tel: 613-948-6111

Directrice principale, Investissement, parteneriats et innovation
Infrastructure Canada / Gouvernement du Canada
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Cc: Sashen Guneratna <sguneratna@cib-bic.ca>; Pranav Shah <pshah@cib-bic.ca>; Jeffrey To <jto@cib-bic.ca>; Kunwar Singh <ksingh@cib-bic.ca>; Olivia Nguyen <onguyen@cib-bic.ca>
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Director, Investments | directrice, Investissement
Office: 416 847-7727
Cell: [redacted]
Email: lcaldwell@cib-bic.ca

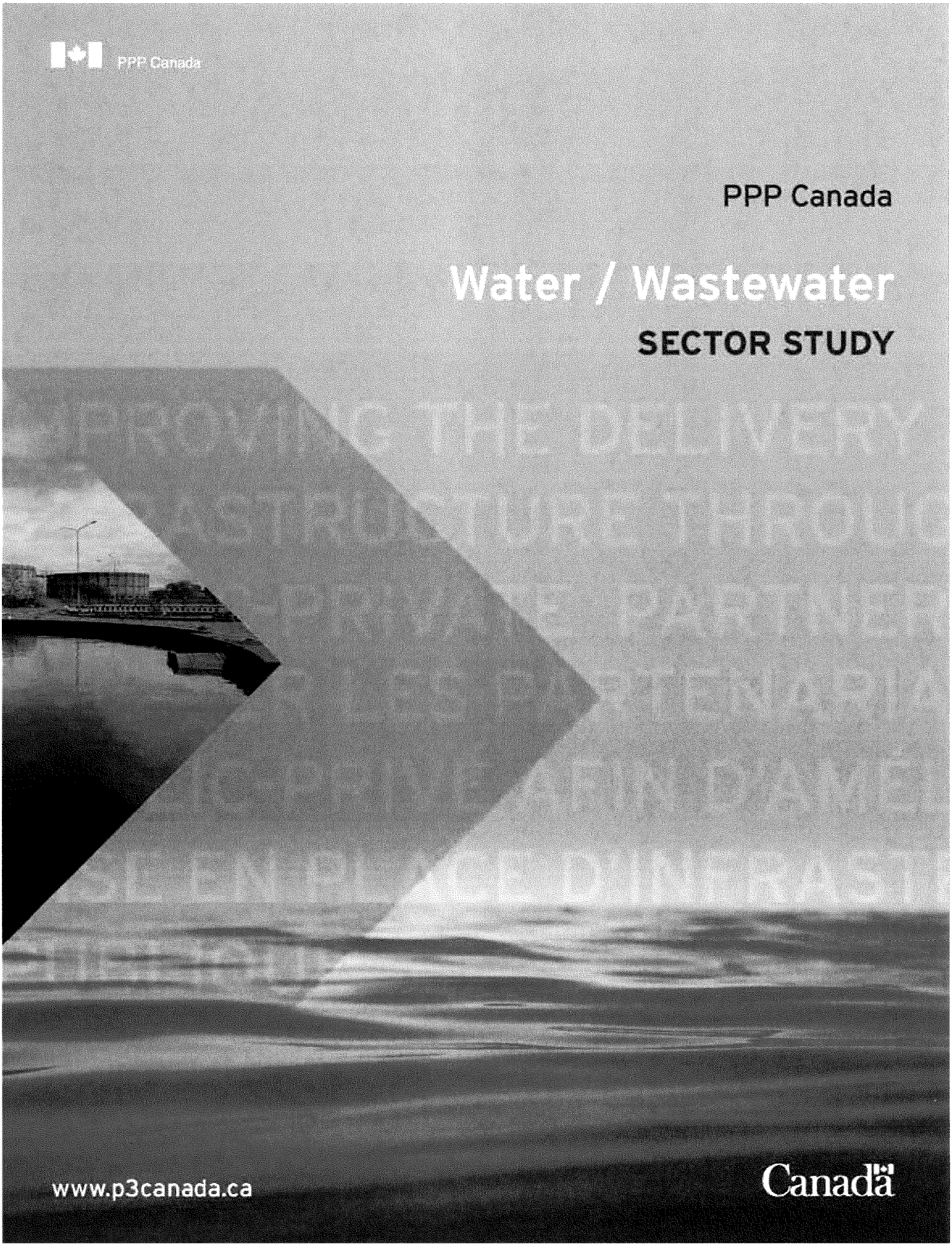
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- 1 **1.3:** Audience
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1.0 Introduction

1.1 PPP Canada

PPP Canada's mandate is to improve the delivery of public infrastructure by achieving better value, timeliness and accountability to taxpayers, through P3s. PPP Canada was created to deliver more P3s by leveraging incentives, demonstrating success, and providing expertise; and to deliver better P3s by promoting P3 best-practice, and capacity-building.

PPP Canada is recognized as a centre of expertise for P3s. PPP Canada is taking a lead role in assessing the suitability of public-private partnership projects seeking funding from federal infrastructure programs in accordance with criteria established by or pursuant to Treasury Board authorities. PPP Canada's advisory services are leveraged collaboratively by provinces and territories, municipalities, First Nations, Federal and private sector stakeholders.

The increased visibility of P3s as a procurement solution for governments is one of the major accomplishments of the P3 Canada Fund and will remain a factor in PPP Canada's ability to develop the P3 market. PPP Canada leverages municipal, provincial and territorial governments, as well as Aboriginal Affairs and Northern Development Canada as primary interlocutors to disseminate information about the P3 Canada Fund. This approach positions PPP Canada as an enabler of P3 projects, and working with provincial P3 agencies to provide project expertise to sponsors; and to deliver better P3s by promoting P3 best-practice, and capacity-building.

1.2 Scope of Work

This document serves to assess the opportunity for using P3 delivery models for the delivery of projects in the water/wastewater sector, and focuses primarily on the potential for the use of the P3 model that has the most comprehensive scope and secure risk transfer, namely the Design-Build-Finance-Operate-Maintain (DBFOM) model. Language in this document that speaks to P3s should be interpreted as specific to the water/wastewater sector, and not necessarily to P3s in general as certain asset classes may have other unique characteristics when considering a P3 implementation.

1.3 Audience

This document has been developed for all levels of government that are actively considering and developing water/wastewater infrastructure projects, and where a P3 model may be a suitable form of financing and procurement. This document may also be of interest to P3 developers that are entering the water/wastewater market and, as such, assumes that the audience is familiar with the Canadian municipal water/wastewater sector and Canadian-style Public-Private Partnership and is not necessarily written for a broad audience.

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1.4 Format of Report

This document is structured as follows. Section 2 focuses on a discussion on water sector investment needs is followed by relevant P3 models that may be suitable for implementation in Section 3. An overview of the market of water/wastewater service providers is discussed in Section 4, along with existing limitations of a DBFOM implementation in Section 5. Key project risks are discussed in Section 6 as they relate to the water/wastewater sector, which lends to the applicability and consideration of various P3 models in Canada in Section 7. Finally, the document summarizes the opportunities for water/wastewater DBFOM projects in Section 8.

1.5 Development Methodology and Enquiries

This document was developed in collaboration with Deloitte. Industry feedback was solicited to review, validate and incrementally capture private sector issues and concerns when implementing P3 processes. This document was then vetted by a number of key interlocutors prior to public dissemination. In the event of any enquires specific to the content of this document, the reader is encouraged to contact PPP Canada directly:

PPP Canada
100, Queen Street, Suite 630
Ottawa, Ontario K1P 1J9
Canada

Telephone: 613-947-9480
Fax: 613-947-2289
Toll Free Telephone: 877-947-9480
Email: info@p3canada.ca

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2.0 Water Sector Investment Needs

2.1 Overall Macro-Level Investment Need

Determining the investment need in the water/wastewater sector with precision is a difficult task, and one that no single agency in Canada has a mandate to establish. There is evidence, however, that the need is substantial. A 2007 survey of Canadian municipalities by the Federation of Canadian Municipalities[1] estimated the total national investment need at $88 billion ($31 billion for refurbishment and $57 billion for replacement and new systems). The Conference Board of Canada reports that actual capital expenditures (in 2002 dollars) in municipal water and wastewater averaged $1.0 billion annually from 1970-1997, and $1.5 billion annually from 1998-2006[2], reaching $2.4 billion in 2006.

Aboriginal Affairs and Northern Development Canada (AANDC) recently released a nationwide assessment[3] of water and wastewater systems in First Nations communities that identified a need for $1.2 billion in investments to meet current applicable protocols and estimates an additional $3.5 billion is needed to meet anticipated population growth over the next ten years.[4]

Whether measured by current investment levels, by the overall macro-level infrastructure gap estimates, or by the needs in First Nations communities alone, the investment need in Canada in the water/wastewater sector is significant.

2.2 Individual Project Size

Because P3 is a project-level solution, germane to the investigation of the opportunity for P3 delivery models in the water/wastewater sector is the size of individual infrastructure projects, in particular with respect to the size of private financing that a project may offer and/or require for the Design-Build-Finance-Operate-Maintain delivery model.

Canadian social and transportation sector P3 projects to date have attracted a market of equity and debt investors with investment requirements that have dictated a minimum investment of approximately $100 million in private long term financing with capital costs typically in the range of $200 million or more. Such opportunities should easily satisfy initial screening process that indicate value in delivering such projects as P3s. PPP Canada has obtained an indication of expected infrastructure projects in the water/wastewater sector from 2011 - 2030 based on a survey of municipalities.[5] In summary, it is anticipated that water/wastewater sector projects with a private investment opportunity of $100 million or more are likely to be limited in Canada. Furthermore, most projects are likely to have a total capital cost significantly lower than $100 million, with the majority of those likely to be lower than $50 million. And, there will be a great many very small projects of scope too small to warrant any type of P3 project delivery.

[1] Mirza, S., *Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure, A Report for the Federation of Canadian Municipalities*, November 2007.

[2] Conference Board of Canada, *Tapped Out: Efficiency Options for Closing the Municipal Infrastructure Gap*, March 2011.

[3] Neegan Burnside, *National Assessment of First Nations Water and Wastewater Systems National Roll-Up Report*, April 2011, prepared for Aboriginal Affairs and Northern Development Canada

[4] According to AANDC, "the National Assessment shows an increase in the number of high risk water systems compared to previous reporting" and that "the results show the majority of risk is due to capacity issues, although infrastructure issues and lack of enforceable standards are also a factor." The capacity issue relates to the qualifications and availability of system operators, an problem which may be addressed by the private sector using O&M contracts for existing systems and DBOM or DBFOM procurements for new systems.

[5] Opus DaytonKnight, *Water, Wastewater and Biosolids Study*, June 2011, prepared for PPP Canada

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There is no consolidated inventory of upcoming water/wastewater projects, the information for which resides at the individual municipal level within capital plans that may have a fair level of project detail for the short-term horizon (e.g. five-years) and only broad conceptual needs defined for the long-term horizon. Despite the lack of such an inventory, a small number of water/wastewater projects in the multiple-hundreds of million dollar capital size range will likely materialize in the foreseeable future, while the majority of the project activity will be smaller projects. This reflects ongoing observations of the industry, the demographics of the many hundreds of municipal water/wastewater systems in Canada, most of which serve smaller populations and hence have relatively small capital requirements, and the need for upgrade and replacement of specific sub-facilities (e.g. pump stations) within broader water/wastewater networks.

It is further highlighted that the $100 million threshold for typical P3 suitability is not firm, is project-specific and may be less relevant to the water/wastewater sector than other infrastructure sectors due to the nature of the market of service providers. The ability to privately finance smaller projects within a P3 structure is discussed in later sections.

2.3 Project Types

2.3.1 GREENFIELD VS. BROWNFIELD WATER/WASTEWATER PROJECTS

Through market research and experience, the majority of the projects identified by PPP Canada are upgrades to existing systems. In project development parlance, these may be considered "brownfield" rather than "greenfield" projects This assessment also applies to the broader national investment need as well, whether the projects are driven by growth or by refurbishment needs In general, brownfield projects are considered less suitable for P3 delivery models primarily due to potential contamination and latent defect risk in existing infrastructure.

Greenfield projects may be more likely in smaller communities where current levels of service are not acceptable, for example where drinking water sources are not communal or not filtered, or where individual septic fields are deemed to be causing environmental impacts (thus requiring a communal sewage collection and treatment system to be installed). Such projects are most likely to be located outside of major metropolitan areas and in some cases may be in locations considered remote.

There may also be greenfield project opportunities in communities experiencing rapid growth, depending on the capacity of existing infrastructure and the nature and location of areas of growth relative to existing serviced areas. Capacity expansions to existing systems which raise capacity through duplication, twinning, or other "bolt-on" approaches may be more greenfield-like than brownfield-like.

2.3.2 NETWORKS VS. TREATMENT

Water and wastewater systems can be broken into two major components:

- Networks:
  - Water: the system of pipes, pumps, and reservoirs that transmit, store, and distribute treated drinking water to customers, much of which is buried
  - Wastewater: the system of pipes and pumps that collect wastewater from customers and convey it to central treatment sites, much of which is buried
- Treatment:
  - Water: treatment plants that through chemical, physical, and biological and physical processes make water extracted from the environment suitable for human consumption, prior to distribution
  - Wastewater: treatment plants that through chemical, physical, and biological processes remove contaminants from collected wastewater such that it is suitable for reuse and/or discharge to the environment

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- Biosolids: processing facilities that through chemical, physical, and biological processes convert solid byproducts of wastewater treatment (waste sludge) into forms suitable for beneficial use and/or disposal to landfill or potentially to the environment

Network projects and treatment projects may have very different profiles in terms of operational intensity, operational risk, and component longevity: treatment projects are operationally intensive and have shorter major component lives, and as result the Value for Money proposition of a P3 will tend to be more compelling for treatment projects than network projects. A network project with a large pump station or a number of pump stations would lie somewhere between a pipe-dominated network project and a treatment project.

The projects identified by PPP Canada are primarily treatment projects with the exception of a few major water or wastewater transmission main (i.e. network) projects.

2.4 Sources of Funding

The water/wastewater infrastructure sponsors of interest to PPP Canada are public: federal, provincial, territorial, municipal and First Nations government.[6] With a few exceptions, Canadian public water/wastewater systems are owned and operated by municipalities. Municipalities fund water and wastewater services (including new projects) through a range of mechanisms including:

- Water rates;
- Property taxes;
- Development cost charges; and
- Government contributions.

Practices for cost recovery and governance vary widely. Rates may be volumetric (i.e. metered) or flat rate. Rates may not cover all costs, with services being subsidized from general revenues of the municipality. In a small number of cases water/wastewater services return a dividend to the municipality. Services may be run by departments with finances integrated with the municipality as a whole, or by separate utility organizations with their own books and cost recovery objectives. Each municipality is a special case.

Development cost charges are intended to collect money from land developers to support the development of the infrastructure needed to support growth. Growth-related projects may be substantially dependent on such charges. A municipality faces risk in undertaking growth-driven projects prior to collecting all necessary development cost charges, but for practical reasons must often do so.

Municipalities often must borrow to support significant capital projects, and it is highly likely that any project large enough to be considered by a municipality for P3 would require borrowing. Government capital contributions have historically played a significant role in many municipal water/wastewater projects. The potential for PPP Canada investments in projects is expected to be of great interest to municipalities.

A municipality's sources of water/wastewater system funding may impact how lenders assess counterparty risk, and must also be taken into account when assessing affordability.

[6] Within this report, "municipalities" is deemed to include First Nations as First Nations have municipal-like responsibilities with respect water and wastewater services

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2.5 Potential Challenges for P3 Delivery Models

The municipal water/wastewater sector investment need is large: perhaps as high as $100 billion over the next 10 to 30 years. However, the anticipated project opportunities are expected to offer the following potential challenges to P3 project delivery models:

1. Most projects will be small with capital values of less than $50 million and opportunities for private finance of $100 million or more will be very rare;
2. The majority of projects will be brownfield rather than greenfield in nature, requiring more complex feasibility analysis and potentially impairing risk transfer and Value for Money;
3. Projects may be subject to an onerous Environmental Assessment process; consideration should be given to fostering outcome/performance based assessments, rather than prescriptive assessment outcomes which may limit the degree of innovation that drives value in a P3;
4. Greenfield opportunities are more likely to be found in rural or remote locations, which are likely to be very small projects and may have limited scope for operations innovation;
5. The increased private sector involvement in solution delivery may also be a perceived threat to existing employees and efforts are required to manage any project delivery to accommodate existing staffing considerations;
6. The credit quality and ability to make payments of smaller municipalities in particular may be of concern to service providers that are accustomed to provincially-backed deals; and
7. Value for Money is more likely to be found in treatment project P3s than network project P3s.

Despite these challenges, the water/wastewater sector has appeal and potential for the application of P3 delivery models because:

- it is possible to readily define projects by their outputs (e.g. water quantity, water quality);
- there is a market of specialized private sector service providers interested in competing to meet performance goals; and
- there is a large scope for innovation due to the potential to include operations, not merely maintenance, in the P3 partners' scope.

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3.0
Relevant P3 models

3.1 Introduction

This section describes P3 models that have been used (or could be viable) for water/wastewater sector projects in Canada and the United States. P3 models fall along a spectrum and generally at least include design and construction elements, to which are added one or more of operations, maintenance, or financing. The available models are combinations of these elements (e.g. Design-Build-Finance, Design-Build-Operate, etc.).

In the water/wastewater sector, because of the tight integration and overlap between operations and maintenance, there is generally no practical ability to separate operations and maintenance from each other as is done, for example, in hospital DBFMs. As a result, Design-Build-Finance (DBF), Design-Build-Operate-Maintain (DBOM), and Design-Build-Finance-Operate-Maintain (DBFOM) form the practical P3 spectrum in the water/wastewater sector.[7] These are summarized on Table 1. The need and/or opportunity to include operations alongside maintenance in a water/wastewater P3 suggests that there may be a broader scope for P3 innovation and value than there is in the social infrastructure sector.

While DBFs to date have proven popular in the water and wastewater sector, the high dependency of operations maintenance, performance on the design (and vice versa), and the inseparability of operations and maintenance lead to DBOM and DBFOM being the preferred models. This is due in large part to the level of risk transfer and private sector involvement, thus providing the greatest potential for Value for Money. Furthermore, this study presents a further opportunity to develop and define the water and wastewater market by emphasizing and encouraging the inclusion of operating and maintenance components in P3 models.

There are however, a number of other alternative models (which are not considered P3s and are therefore not addressed in this study) used for provision of water/wastewater sector infrastructure. These include:

- operations and maintenance contracts for existing infrastructure systems (availability style, and affermage/lease style in which the contractor takes at least some revenue risk); and
- program-wide (rather than project-specific) alliances or joint-ventures for capital project delivery, with examples including Scottish Water Solutions and Winnipeg's wastewater program agreement with Veolia.

In addition, private capital has a major role in the provision of water/wastewater sector services in instances where the infrastructure is not publically owned. This "regulated private utility" model is prevalent in the United States (where municipal-scale private water systems are not uncommon) and in the United Kingdom (where publically-owned regional water companies were divested to the private sector in 1989), France, and many other countries. There are a small number of regulated private water utilities serving municipal areas in Canada, with an example being EPCOR's water utility serving the City of White Rock in BC.

In the utility model the private sector has rate-setting authority and takes the risk associated with meeting water demand. It needs to be highlighted that the P3 models contemplated herein do not transfer this authority and risk to the contractor, and that pricing and revenue collection for water and wastewater services remains fully in the municipality's control.

[7] DBF is not considered by all to be P3 because it does not encompass project operations. However, it does offer some important risk transfer opportunities and is a common non-traditional project delivery in the water sector.

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TABLE 1 Overview of Relevant Water Sector P3 Models

		P3 MODELS		
PROJECT RESPONSIBILITY	TRADITIONAL DESIGN-BID-BUILD (DBB)	DESIGN-BUILD-FINANCE (DBF)	DESIGN-BUILD-OPERATE-MAINTAIN (DBOM)	DESIGN-BUILD-FINANCE-OPERATE-MAINTAIN (DBFOM)
Ownership of Asset	Municipality	Municipality	Municipality	Municipality
Needs Assessment	Municipality	Municipality	Municipality	Municipality
Investment Decision	Municipality	Municipality	Municipality	Municipality
Project Planning	Municipality	Municipality	Municipality	Municipality
Design	Consultant selected on qualifications and price	Qualified special purpose DBF contractor selected on design and price.	Qualified special-purpose P3 partner selected on design, O&M plan, and price.	Qualified special-purpose P3 partner selected on design, O&M plan, and price. Financing may be for all or a portion of total capital cost.
Construction	Qualified general contractor selected by tender			
Construction (short-term) Financing	Generally not required since municipality pays general contractor for construction progress			
Operation	Municipal staff	Municipal staff		
Maintenance	Municipal staff	Municipal staff		
Rehabilitation	Municipal staff or design contract and tendered construction contract	Municipal staff or design contract and tendered construction contract		
Expansion	Design contract and tendered construction contract	Design contract and tendered construction contract		
Financing (long term)	Municipality	Municipality	Municipality	Municipality (portion)
Funding	Municipality	Municipality	Municipality	Municipality
Asset Sponsorship	Municipality	Municipality	Municipality	Municipality
Pricing	Municipality	Municipality	Municipality	Municipality

a - limited consideration of this model is given in this Framework document due to the limited risk transfer and the lack of operating and maintenance components in the model.

The remainder of this section describes key characteristics of each of the P3 models including potential benefits and challenges associated with each.

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3.2 Rating of Models Against High-Level Objectives

Table 2 below rates the suitability of the models measured against some common objectives and some other key concerns, based on the information provided in previous sections. The models as contemplated in the table reflect common application of the models either on water/wastewater sector projects, or on projects in other sectors, in Canada.

TABLE 2 Rating of P3 Models Against Typical High-Level Objectives

OBJECTIVE	DBF	DBFM	DBFM
Suitable market of service providers	Very Good	Very Good	Good
Potential for innovation	Good	Very Good	Very Good
Consideration of life cycle in design	Poor	Good	Very Good
Transfer of construction cost risk	Very Good	Very Good	Very Good
Transfer of construction schedule risk	Very Good	Very Good	Very Good
Transfer of lifecycle cost risk	Poor	Good	Very Good
Transfer of operating performance risk[a]	Poor	Good	Very Good
Quality of long term security[a]	Poor	Poor	Very Good
Marketability for large projects > $220 million	Very Good	Very Good	Very Good
Marketability for mid-sized projects > $50 million < $220 million	Very Good	Very Good	Very Good
Marketability for small projects < $30 million	Very Good	Very Good	Untested
Summary assessment	Offers short term benefits but may raise long term performance risks for sponsor. Of greater concern for treatment projects than network projects.	Strong model for the Canadian project pipeline. Key concern is quality of long term security.	Strong model for large and small projects. Untested, but shows promise for mid-sized projects.

a - these risks are of particular concern for treatment projects, less so for network projects

b - limited consideration of this model is given in this Framework document due to the limited risk transfer and the lack of operating and maintenance components in the model.

The table above, even on criteria rated "very good", does not necessarily mean that the model will offer Value for Money, which must be assessed on a project-by-project basis. The following sections explore potential improvements and modifications for the delivery models to address criteria rated "poor".

3.3 Design-Build-Finance

With Design-Build-Finance (DBF), the design and construction are bundled together and tendered as a whole.[8] DBF contracts are typically fixed-price, which is possible because responsibility for the design and the construction is assigned to a single party. Usually DBF competitions are awarded on lowest price; however it is possible to introduce qualitative evaluation criteria as well. Once the asset is constructed and passes acceptance testing,[9] DBF is similar to that of traditional procurement. The municipality is responsible for operation, maintenance, and rehabilitation of the asset. The warranty period is typically one or two years, similar to a tendered construction contract.

[8] There is a variation of DBF called "progressive DBF" in which the sponsor selects the DBF contractor based on qualifications prior to commencing design. This has some characteristics in common with an alliance or construction management at risk and the sponsor does not have a fixed price at the outset of the contract. It is not considered further in this document.

[9] Acceptance testing verifies that the system meets the performance requirements specified. This is done by operating the system and demonstrating the required performance.

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In water/wastewater projects, there is considerable risk during the operation phase. As illustrated in Table 2, DBF models lack long term financing and provide limited consideration of operations and lifecycle maintenance performance. Given this limited consideration of lifecycle risk and the importance of operations to treatment projects, the DBF model is not further explored in latter sections of this report.

3.3.1 PAYMENT MECHANISM

In the P3 context, a DBF contract may be paid for based on achievement of specified construction milestones or upon final completion of construction. In either case, short term private construction financing must be arranged by the contractor. The construction financing provides the contractor with an incentive to complete the project on time. In some cases, the proponent will also need to finance hold-backs during the "bedding in" period of operations. This "bedding in" period refers to a timeframe that allows the service provider a specified period of time in which to integrate their service delivery, during which time a lower threshold is applied to the deduction regime.

3.3.2 SECURITY

If the milestone payments are sufficiently back-end loaded, security for the construction period is achieved indirectly by the short term financing placed by the contractor (the lender can be expected to require bonding or other forms of security and to take action to complete construction and receive payment if the contractor flounders). The use of a single substantial completion payment rather than milestones (i.e. a fully back-end loaded payment structure) maximizes the security, but increases costs.

Otherwise, security for the construction period may be secured with performance bond and payment bond (labour and materials) in a total amount typically at least equal to the contract price. The bond covers both design and construction, which makes a DBF performance bond different and more costly than a typical construction bond seen on Design-Bid-Build projects. Letters of credit (LCs) may also be used.

Security for the warranty period may be secured through a holdback, parent company guarantee, or a liquid security such as a letter of credit.

3.3.3 POTENTIAL BENEFITS OF DBF

DBF offers the benefits of potential capital cost savings through innovation of competing Design-Build-Finance teams in a competitive procurement, cost certainty through transfer of construction cost risk to the DBF contractor, and time certainty as encouraged by paying on milestones as opposed to progress. Innovation is also in part driven by the integration of design-build elements in the project. Another frequently-cited benefit is the potential to deliver a finished facility faster than Design-Bid-Build.

3.3.4 POTENTIAL PROBLEMS WITH DBF

Of all relevant project delivery models (traditional Design-Bid-Build, DBF, DBOM, and DBFOM), DBF by nature has the least consideration of life cycle project costs. As a result, the key potential shortcoming of DBF stems from the short-term interest of the DBF contractor. This is compounded by procurement processes that place emphasis on capital costs. In these cases, the fact that the contract is awarded solely or primarily based on lowest price often comes at the expense of long-term innovation and lower cost operating solutions. An obvious potential result of such a situation is a low-cost project that is very expensive or unwieldy to operate because very little consideration is given to the operating, maintenance and lifecycle costs of the project. The potential for such an outcome is heightened for water/wastewater sector treatment facilities which are electro-mechanical in nature and operationally intensive. There is little or no financial recourse for a municipality if a DBF project turns out to be more difficult or expensive to operate and/or maintain than planned. It is primarily for these reasons that PPP Canada typically gives limited consideration to this particular model as it often fails to meet the long term risk transfer and lifecycle cost objectives of P3 project delivery.

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While this shortcoming can be partially mitigated by placing certain limits on the DBF contractor through prescriptive specification rather than performance specification (ie. specifying acceptable treatment processes, equipment suppliers, or materials specifications) the more limitations that are put on the potential solutions, the smaller the opportunity for innovation, cost savings, and risk transfer.

Another approach to mitigating this risk is to introduce qualitative and quantitative evaluation criteria that incorporate the assessment of operability and life cycle costs into the proposal evaluation. Bonds can be used to secure any annual operational guarantee of performance by proponents and called if a constructed project does not meet the operational thresholds stipulated by the proponent during the procurement phase, although this adds an additional level of complexity and cost to the project.

3.3.5 FREQUENCY OF USE AND EXAMPLES

DBF (both fixed-price DBF and progressive DBF) is relatively common for water/wastewater sector projects in the US, but significantly-sized projects in Canada have been rare.

TABLE 3 Examples of Operating DBF Projects[10]

PROJECT	APPROX. CAPITAL COST ($MILLIONS)[11]	SPONSOR
New Dartmouth Water Treatment Plant[12]	38	Halifax Regional Water Commission, NS
New Water Treatment Plant	7	Town of Cochrane, AB
Arbennie Pritchett Wastewater Treatment Plant	50	Okaloosa County, FL
Eagles Point Wastewater Treatment Plant Replacement	45	St. Paul, MN

3.3.6 PROJECT SIZE LIMITATIONS

The short term financing needed for a contractor to undertake a DBF project is much like standard construction financing. Lenders concentrate on the quality of the contractor, and utilize a technical advisor to confirm a competent design and reasonable fixed price, and then administer drawdowns during the construction period. Due diligence is simpler on a DBF than DBFOM because the lender is not exposed to operating period risks.

Limited market sounding suggests that minimum bank construction financing tickets are in the range of $50 million, with larger amounts preferred. However, smaller construction financings have been observed, and for smaller amounts the financing and security arrangements are often "off the shelf" and efficient for contractors to obtain. Also, for projects with lower capital values, contractors may finance DBF projects on their balance sheets or utilize existing credit facilities. Regardless of the source of the financing, DBF projects will tend to favour contractors of a size and financial strength that allows them either to self-finance construction or satisfy lender's due diligence and security requirements.

3.4 Design-Build-Operate-Maintain

Design-Build-Operate-Maintain[13] (DBOM) procurement builds on a Design-Build-Finance format by integrating the operation and maintenance of the constructed asset into the contract. The contractor is responsible for designing, building, operating, maintaining, and rehabilitating the asset over a long period of time. The intent of a DBOM is to transfer life cycle cost risk of the asset to the contractor, having the contractor take into account not just initial capital, but operation and maintenance and rehabilitation costs into full account as part of their proposal.

[10] The US examples are fixed-price DBF projects. It is not known whether the Canadian projects were fixed-price DBF or not.

[11] All project capital costs presented in this report are in either US or Canadian dollars depending on the project location, and have not been inflation-adjusted to a common year.

[12] Project was originally procured as a DBFOM

[13] Traditional water sector nomenclature for this delivery model is "Design-Build-Operate (DBO)", where "operate" encompasses the maintenance function.

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3.4.1 PAYMENT MECHANISM

A DBOM is paid for as if it is two separate contracts: a Design-Build-Finance contract, in which capital is paid for through milestone payments or a substantial completion payment, and an operations and maintenance (O&M) contract which is paid over the term of the operating period.

The O&M payment is an availability style payment that covers routine operations and maintenance, with deductions made for non-performance. O&M payments (and deductions) are typically indexed to inflation or other relevant industry index. A portion of the O&M payment may be variable, depending on volume of water supplied or received, to account for the variable cost of power and chemicals needed for treatment and pumping. Alternatively, such costs may "flow through" to the sponsor to avoid markup by the contractor, subject to the contractor being responsible for any inefficient use of such inputs.

Rehabilitation payments can either be made on a regular schedule at a constant (but indexed) amount (i.e. a smooth payment approach) or on an irregular schedule of differently-sized payments as bid by the DBOM contractor (i.e. a "lumpy" payment approach that is intended to match the contractor's actual timing of rehabilitation expenditures). Rehabilitation payments may be withheld if the contractor is not performing, although this may not in itself provide the contractor with an incentive to perform rehabilitation.

Within this report, contemplation of the use of DBOM on future projects includes, by definition, short-term construction financing provided by the contractor. Past DBOM project examples will not necessarily have included short term construction financing.

3.4.2 REHABILITATION

For greenfield assets, rehabilitation (major maintenance, replacement, recapitalization) should be the responsibility of the contractor, and payment should be made to the schedule bid by the contractor. If the contract includes the take-over of existing assets, the ability to transfer rehabilitation risk for the existing assets may be limited, especially for buried infrastructure that cannot be inspected.

Rehabilitation costs may be significant, and would typically be incurred towards the end of the operating period. Examples include replacement of pumps and motors (typical lives of 15 to 20 years), control and SCADA systems (typical lives of 10 years), filter media (typical lives of 5 to 15 years), and perhaps even hydraulic control structures, piping, and valves especially in wastewater and biosolids projects that have more aggressive environments than water projects.

3.4.3 SECURITY

If the milestone payments are sufficiently back-end loaded, security for the construction period is achieved indirectly by the short term financing placed by the contractor (the lender can be expected to require bonding and to take action to complete construction and receive payment if the contractor flounders). The sponsor may require bonding or an LC if milestone payments are not back-ended.

The long term performance of the contractor for O&M may be secured by one or more of the following means:

- Performance bond (typically in an amount equivalent to one year's O&M payments);
- Letter of credit (generally as an alternative to a performance bond, and in an amount of similar magnitude - contractors are not likely to be able to post large LCs for long periods due to balance sheet impacts); and
- Company guarantee or parent company guarantee.

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Performance bonds and LCs can provide security against the annual, routine performance of the contractor but are unlikely to cover any significant portion of the contractor's rehabilitation obligation. Guarantees must be relied on to secure the contractor's obligation for rehabilitation.

Since bonds and LCs are subject to expiry and risk of non-renewability, from a practical standpoint DBOMs ultimately rely on guarantees for their long term security.

3.4.4 POTENTIAL BENEFITS OF DBOM

DBOM offers the benefits of potential life cycle cost savings through innovation of competing Design-Build-Operate teams in a competitive procurement, cost certainty through transfer of construction cost risk to the contractor, and time certainty as encouraged by paying on milestones as opposed to progress. Another frequently-cited benefit is the potential to deliver a finished facility faster than Design-Bid-Build. Finally, adding significant O&M components to a design-build project (to effectively create a DBOM) also creates strong performance incentive structures as a result of the at-risk nature of operating profits, which may be even more of an incentive compared to equity considerations

3.4.5 POTENTIAL PROBLEMS WITH DBOM

The primary problem with DBOM relates to the quality of the long term security. In the event that the contractor does not perform and escalating remedies do not cause the contractor to self-correct, the sponsor is likely to have to sue the contractor or a parent company of the contractor for damages incurred in self-performing the work - especially if the non-performance is related to rehabilitation.

Overall, the quality of the long term risk transfer in a DBOM ultimately relies on company guarantees, the value of which can only be judged subjectively and only at the time of contract award. Given that a DBOM could have a term of 20 to 30 years, the value of a company's promise could erode significantly depending on intervening events.

However, the consideration of life cycle costs and the long term risk transfer of a DBOM are certainly superior to that of a DBF, as long as the procurement process is well managed such that only highly qualified companies with strong reputations to protect are invited to submit proposals.

3.4.6 PROJECT SIZE LIMITATIONS

A DBOM is essentially a DBF plus an O&M contract. The payment of capital is not exposed to operating period risks and therefore the comments on project size limitations related to construction financing for DBF apply.

A smaller sized DBOM, however, does have cost implications for proponents preparing their proposal. Many proponents will evaluate their costs in developing a proposal and attending various meetings during the procurement phase, and weigh this with a win probability to determine whether or not to pursue the opportunity. It is for this reason that private sector interest on small scale DBOMs may be limited. Governments should give consideration to the balance of project size and complexity during the procurement phase to ensure private sector interest in the opportunity.

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3.4.7 FREQUENCY OF USE AND EXAMPLES

While DBOM appears to be less common than DBF in North America, this delivery model has been used on a number of Canadian and US projects as listed below:

TABLE 4 Examples of Operating DBOM Projects

PROJECT	APPROX. CAPITAL COST ($MILLIONS)	SPONSOR
New Wastewater Treatment Plant	14	Town of Jasper, AB
Wastewater Treatment Plant Upgrade	11	Town of Okotoks, AB
New Water Treatment Plant	4	Town of Port Hardy, BC
New Wastewater System	23	Town of Sooke, BC
New Wastewater Treatment Plant	16	Lac La Biche County, AB
New Water Treatment Plant	81	City of Seattle (Cedar), WA
New Water Treatment Plant	65	City of Seattle (Tolt), WA
Wastewater Plant Upgrade and New Combined Sewer Overflow Facility	24	City of Holyoke, MA
New Wastewater Treatment Plant	20	City of Cle Elum, WA
New Wastewater Treatment Plant	43	City of Filmore, CA
New Water Treatment Plant	>100	Lake Pleasant, AZ
New Wastewater Treatment Plant[14]	172	Pima County, AZ
New Wastewater Treatment Plant[15]	130	Spokane County, WA
New Water Treatment Plant	160	San Diego County (Twin Oaks), CA

A feature of several of the Alberta DBOM projects is that the O&M responsibility of the contractor extends not just to the new asset designed and constructed by the contractor, but to the existing water distribution and sewer collection infrastructure as well. This bundling of existing infrastructure O&M into the P3 can bring economies of scale to overall operations, and also make the project more attractive to the market by providing a bigger O&M opportunity.

3.5 Design-Build-Finance-Operate-Maintain[16]

DBFOM is essentially DBOM with the additional requirement that the contractor finance some or all of the capital cost of the project.

3.5.1 PAYMENT MECHANISM

The payment mechanism for a DBFOM is performance-based and comprises the following payment streams:

- Capital contributions during or at the end of construction (if upfront contributions are made);
- Capital payments over the operating term (i.e. repayment of privately-financed capital);
- O&M payments over the operating term; and
- Rehabilitation payments over the operating term.

The capital and O&M payments combined are an "availability" payment that is subject to deductions for non-performance. The O&M payment covers routine operations and maintenance. O&M payments (and deductions) are typically indexed to inflation or other relevant industry index. A portion of the O&M payment may be variable, depending on volume of water supplied or received, to account for the variable cost of

[14] At time of writing this project is awarded but not built. A bid protest has been filed by a losing bidder.
[15] Acceptance testing expected August 2011.
[16] Traditional water sector nomenclature for this delivery model is "Design-Build-Finance-Operate (DBFO)", where "operate" encompasses the maintenance function.

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power and chemicals needed for treatment and pumping. Alternatively, such costs may "flow through" to the sponsor to avoid markup by the contractor, subject to the contractor being responsible for any inefficient use of such inputs (i.e. efficiency risk).

Rehabilitation payments can either be made on a regular schedule at a constant (but indexed) amount (i.e. a smooth payment approach) or on an irregular schedule of differently-sized payments as bid by the DBOM contractor (i.e. a "lumpy" payment approach that is intended to match the contractor's actual timing of rehabilitation expenditures). Rehabilitation payments may be withheld if the contractor is not performing.

3.5.2 SECURITY

The long term performance of the contractor is secured by the direct investment (i.e. private financing) in the project by the contractor. The security for the municipality arises from the ability, using the payment mechanism, to hold back payments for non-performance, including if it becomes apparent that the handback conditions are not likely to be met by the contractor. During the operating period, lenders will take action to ensure that the flow of capital payments are not interrupted or reduced by contractor non-performance.

In a DBFOM that is fully privately-financed (i.e. has no capital contribution from the sponsor during construction), the contractor does not receive any payment until the asset is constructed, put into service, and performing. Security for the construction and operating period is achieved indirectly through the private financing. During the construction period, the lenders can be expected to require bonding or other security from the contractor and to take action to complete construction and commence receiving the capital payments if the contractor flounders. During the operating period the lenders can be expected to ensure that the contractor's performance meets the project specifications and does not trigger availability payment deductions that imperil repayment of the lenders.

In a DBFOM that is partially privately financed (i.e. has capital contributions from the sponsor), security for the construction and operating period is achieved indirectly through the private financing to the extent that the financed amount is high enough to secure the risk transfer.[17] If the privately financed portion is small (as in a "wide equity" structure, discussed later) then the sponsor may require bonding or an LC to supplement the private financing. The need for construction period security will depend on the extent to which capital contribution payments are back-ended, as discussed previously for DBF.

Outside lenders require additional due diligence, which can provide increased comfort to sponsors, as they ensure that the technical and financial aspects of the project are reviewed. They will also ensure legal due diligence of all project documentation. Added security is provided during operations as lenders are able, contractually, to step in to solve things before small issues grow to a point where they threaten the project and, in the worst case, they can replace contractors.

3.5.3 POTENTIAL BENEFITS OF DBFOM

DBFOM offers the benefits of potential life cycle cost savings through innovation of competing Design-Build-Operate teams in a competitive procurement, cost certainty through transfer of construction cost risk to the contractor, and time certainty as encouraged by paying on milestones as opposed to progress. In addition, DBFOM puts private capital at risk over the full operating the term of the agreement, which provides strong incentive for the contractor to perform and a high level of security for the sponsor. The private financing secures the risk transfer contemplated by the project agreement in a DBFOM.

A DBFOM aligns with all of PPP Canada's reasons to invest in and support a project: capture of private sector expertise, use of performance specifications, putting private capital at risk, cost certainty, time certainty, and consideration of life cycle costs in the selection of infrastructure solutions. These considerations ultimately result in better value for Canadian tax payers.

3.5.4 POTENTIAL PROBLEMS WITH DBFOM

While DBFOM is perhaps the ultimate form of P3 in terms of risk transfer and harnessing private sector expertise, it does suffer from one key problem from the standpoint of the sponsor: the cost of private financing. On any given project, a municipality will be able to secure capital financing at lower cost than the DBFOM

[17] Project-specific analysis is required to determine this threshold.

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contractor can. The additional cost of contractor financing must be overcome by the benefits of the DBFOM approach for a project to offer Value for Money. This issue is typically addressed by the sponsor contributing capital during construction to reduce the amount of private financing needed. A related issue is the availability of financing, regardless of the cost, for smaller projects. This issue is discussed separately in Section 5.

Additionally, the complexity of a DBFOM, which includes private financing solutions, operations and maintenance, often comes at a cost. These costs are incurred primarily as a result of the increased amount of due diligence and overhead required for private sector consortia to thoroughly understand the project's requirements, degree of risk transfer, and other incremental complexities of the DBFOM model.

3.5.5 FREQUENCY OF USE AND EXAMPLES

In Canada, there are only eight known water/wastewater DBFOMs. Even in other countries with established P3 programs such as the UK and Australia, there are relatively few examples of water/wastewater sector DBFOMs. The table below presents a list of water/wastewater sector DBFOMs in these countries, plus the US.

TABLE 5 Water/Wastewater DBFOM in UK, Australia, and US

Northern Ireland (UK)	• Project Alpha: UK's first DBFOM for water (June 2006) –refurbishment of 5 regional water treatment plants • Project Omega: refurbishment of 4 major wastewater treatment plants
Australia	• Barwon Water Biosolids Management Project • Campaspe Water Reclamation Scheme (Wastewater Treatment) • Sydney Water WTPs: ◦ Prospect Water Filtration Plant ◦ (Wyuna) Illawarra Water Filtration Plant ◦ (Wyuna) Woronora Water Filtration Plant ◦ Macarthur Water Treatment plant • Mundaring Water Treatment PPP (very recently awarded – February 2011)
UK	• Project Aquatrine – 3 large contracts for water, sewer, drainage services on Ministry of Defense sites
US	• Edwardsville Water & Wastewater Treatment Facilities (IL) • Keystone Wastewater Treatment (SD) • Santa Paula Water Reclamation Plant (CA) [$58 million capital cost]

Canadian experience with DBFOMs in the water/wastewater sector is limited, and the projects have been relatively small.

TABLE 6 Canadian Water Sector DBFOM Projects

PROJECT	APPROX. CAPITAL COST ($ MILLIONS)	LOCATION
New Water Treatment Plant	23	City of Moncton, NB
New Wastewater Treatment Plant	16	Province of BC (Britannia)
Wastewater Treatment Plant Upgrade[18]	15	Town of Taber, AB
Cartier (New) Water System	10	Manitoba Water Services Board, MB
Wastewater Treatment Plant	10	Dysart, ON
New Water and Wastewater Systems[19]	30	Cavan-Millbrook, ON
Wastewater Treatment Plant	40	Kananaskis, AB
New Wastewater Treatment Plant	333	Victoria, BC

[18] The privately financed amount in this project is quite a small proportion of the overall capital cost and therefore is not included in the total cited of four DBFOM projects.

[19] This project was originally awarded as a DBFOM to Corix. The DBFOM approach was later abandoned and the project was procured conventionally.

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3.6 Long Term P3s and Forms of Security

As noted above, the risk transfer in a long term P3 (i.e. DBOM, DBFOM) is crystalized to various extents depending on the form of security inherent in the transaction structure. Table 7 summarizes the forms of security available and assesses their relative strengths, the ease of the sponsor to exercise due diligence, and the liquidity and utility of the security.

TABLE 7 Forms of Long Term (Operating Period) Security

Security Type	Applicable P3 Model	Relative Strength of Security	Ease of Sponsor Due Diligence	Liquidity/Utility for Sponsor	Typical Amount of Coverage
Company guarantees	DBOM	Weak; provides a promise to perform. Backed up by need of firm to protect reputation	Low, difficult to evaluate a contractor for the quality of its promise to perform	Poor, administratively clumsy to collect on, may need to sue	Conceptually covers any costs necessary to rectify performance
Performance bonds	DBOM	Moderate, bonding company conducts due diligence on contractor and guarantees payment	Moderate, reliance on bonding firm to conduct due diligence	Moderate, must deal with bonding company and satisfy conditions to collect. Then sponsor must rectify performance and/or replace contractor	Typically covers only one or two years of O&M costs
Letters of credit	DBOM	Strong, letter is irrevocable and bank guarantees payment	High, reliance is on the issuing bank, not the contractor	Moderate, can draw down letter on demand. However sponsor must rectify performance and/or replace contractor	Practical and reasonable limit, likely similar to a performance bond
Equity investment	DBFOM	Strong, contractor faces loss of capital	High, financial capacity and commitment to invest equity is easy to establish during procurement process	High, can rely on contractor to resolve performance to mitigate its losses without sponsor involvement.	Approximately 10% of private capital in a DBFOM. Could be 20% or more in an all-equity DBFOM.
Third party debt investment	DBFOM	Very strong, lender faces loss of capital and seeks risk-free conditions	High, financing is either committed at bid submission or soon after	Very high, can rely on lender to monitor contractor, and step in to resolve performance to mitigate its losses without sponsor involvement	Approximately 90% of private capital

The table above does not capture the particular benefit of equity and third party debt with respect to the enforcement of asset handback condition requirements. In a typical DBFOM, the sponsor may withhold capital payments in the last few years of the contract if it appears that the asset condition will not meet the handback requirements. Not only is this a strong incentive for the contractor to rectify the condition, the withheld payments are a source of cash that the sponsor may use to rectify performance itself in the unlikely event that the contractor does not rectify the situation. The DBFOM is an elegant solution, providing both the strongest incentive for the contractor and a self-funding mechanism for the sponsor in the event the contractor does not comply.

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4.0 Market of service providers

4.1 Overview

For a water/wastewater sector P3 market to be viable, there needs to be a robust market of service providers with the requisite expertise and appetite for project opportunities. Without this, it may not be possible to conduct competitive procurements, which are a fundamental driver of value in P3s. Based on market sounding on P3 water/wastewater sector projects over the past ten years, and despite the lack of water/wastewater sector P3 procurements, there is a market of qualified service providers with strong interest in Canadian opportunities of all sizes.

The nature of the market of the water/wastewater sector typically leads to much more integrated bid consortia than other P3 markets. This is primarily a result of the nature of the water/wastewater asset and the inseparability of design, operations and maintenance components of the actual solution. Furthermore, the core expertise in a water/wastewater solution typically lies in the O&M component. As a result, integrated bid consortia are typically led by water/wastewater specialty firms that specialize in design, operations & maintenance, although it is also possible that P3 developers may also lead consortia on DBFOM models.

In the design and build categories, there could be strong interest from local/regional engineering and contracting firms. For large projects with the opportunity for $100 million or more in private financing (or $10 million or more in equity-only deals), there could be strong interest from additional P3 financiers.

4.2 Observations

4.2.1 SPECIALTY FIRMS EXPECTED TO LEAD P3 BIDS

DBF, DBOM, and DBFOM projects are most likely to be led by the water/wastewater service specialty firms, rather than equity providers. These firms have the specialist expertise necessary to address all aspects of project development and execution internally and have a lesser need to form consortium SPVs as compared to what is observed for P3s in the health care sector, for example.

Specific to financing, water specialty firms have expressed a willingness in the past to finance projects. That said, there exists two subgroups with different viewpoints on financing. The "utility-oriented" firms see the financing as an opportunity to invest, so for them, DBFOM is preferred to DBOM. The other water/wastewater service specialty firms have indicated a preference for DBOM as compared to DBFOM; however, the financing component is tolerated to gain access to the overall project opportunity.

Within water/wastewater service specialty firms, water and wastewater "utility-oriented" companies may be able to finance small to mid-sized projects efficiently, without the high transaction and arranging costs typically associated with third party project finance debt. These "utility-oriented" contractors open up the potential of DBFOM to smaller projects, although it may be difficult to attract three competitive contractors to each competition given the small number of players.

4.2.2 REPUTATIONAL RISK

The water/wastewater P3 market is increasingly being driven by O&M service providers given performance is often measured by the O&M component of water/wastewater projects. As such, reputational risk provides a strong incentive mechanism for the proponent to perform its obligations under the project agreement. A company that can successfully deliver a large project with significant emphasis on the O&M service delivery portion bodes well for the organization in terms of developing additional expertise and experience and

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competing on future opportunities in this sector. Conversely, companies that struggled or failed to perform in previous projects often have difficulties securing future projects. In practice, companies may even be willing to take financial losses on a project in order to maintain and protect its reputation and public perception. This is likely unique to the water/wastewater sector as other P3 markets may place more emphasis in the roles of construction firms and/or equity providers.

4.2.3 ROLE FOR PURE P3 DEVELOPERS

Pure P3 developers and financiers typically lead bid development, invest equity, and arrange debt for their P3 projects. There may be limited room for such players in the market due to the capabilities of the specialty water/wastewater service firms - although these firms may value the experience of P3 developers in developing bids. P3 equity investors would likely welcome the opportunity to participate on projects and invest equity.

4.3 Concerns of the Market

4.3.1 APPROVALS

A significant risk for service providers is the risk that procuring authorities enter the procurement process without due consideration to project approvals and engagement. Public resistance has aborted several Canadian water/wastewater sector P3 procurements mid-stream: Whistler wastewater, Metro Vancouver Seymour water. Very recent resistance to water/wastewater sector P3s has been observed in Mission, BC, Winnipeg, MB, the Capital Regional District (Victoria, BC), and Abbotsford, BC.

As such, sponsors need to ensure that they have all associated approvals to proceed before entering the procurement process. This will require an acceptance and approval of the P3 model and sufficient financing to complete the project.

4.3.2 PROCUREMENT PROCESS

A determination by the private sector on whether or not to pursue an opportunity is typically made at the RFQ phase of a project. In some instances, salient project details may not be provided to proponents until the RFP phase and respondents commit resources before they have a full appreciation of the project. Occasionally, and at the detriment of the sponsor, proponents are unable to economically justify pursuing an opportunity and developing a proposal once these details are released and instead elect to withdraw from the RFP process leaving a smaller pool of qualified proponents. This results in a less robust competition along with potentially material impacts on Value for Money.

Sponsors can mitigate this procurement process risk by fostering, to the degree possible under municipal/territorial/provincial procurement regulations, open dialogue and transparency early in the procurement phase so that potential respondents can make an informed decision regarding their participation in the procurement of the project. This includes publishing as much project related documentation as possible (i.e. estimates, level of risk allocation, forms of contracts, anticipated evaluation methodology, etc.) to better inform respondents on the project.

4.4 Conclusion

Although to date P3 delivery models have been used infrequently for water and wastewater projects in Canada, there is an active market of service providers in the water/wastewater sector that have the capability and interest to participate in DBF, DBOM, and DBFOM projects. Generally speaking, and subject to the project size limitations for DBFOM discussed in Section 5, it is anticipated that well-structured P3 projects would attract sufficient interest from the market to conduct a competitive procurement. The makeup of interested parties can be expected to vary based on the delivery model selected for a project, as some players seek financing opportunities (favouring DBFOM) while others prefer to avoid financing (favouring DBOM).

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5.0 Financing-related project size limitations for DBFOM

5.1 Introduction

It is the financing component of the DBFOM that secures long term risk transfer, which is the primary reason that PPP Canada generally favours delivery models with long term financing over all others. In addition, the due diligence that third party lenders bring to a project offers an additional layer of scrutiny that further protects the sponsor from project risk in addition to protecting the lender. These key attributes of the DBFOM model results in the most value for taxpayers.

The amount of private financing that a DBFOM requires influences its marketability and viability due to constraints on the various providers of financing to such projects. This section explores the limitations on project size that may be imposed by financiers. The concern is with the minimum investment criteria, since most water/wastewater sector projects are expected to be relatively small.

The relevant measure of project size with respect to the discussion of financing is the amount of private financing required, which depends on both the capital cost of the project and the amount of capital contribution provided by the sponsor. Sponsor capital contributions are made to reduce the amount of private financing needed, and thereby achieve or improve Value for Money. Under current market conditions, it is common for substantial completion payments in the range of 30%-50% to be made. For example, a project with a capital cost of $220M would leave between $154M and $110M to be privately financed.

5.2 DBFOM with Third Party Debt

With the exception of the two "wide equity" hospital DBFM projects in BC, DBFM/DBFOM projects in all sectors in Canada are typically financed with gearing of approximately 90% debt and 10% equity, with the debt provided by third parties (i.e. by banks, bond underwriters/dealers, or other investors, not by the contractor or its parent companies). The 90:10 capital structure (also known as "gearing") provides a relatively low cost of financing, since debt returns are significantly lower than equity returns. The capital structure is dictated by the lender(s).

5.2.1 EQUITY

Equity investors typically have a minimum investment "ticket" size, below which it is not worth their while to undertake the due diligence needed and/or invest risk capital in preparing a bid. When questioned, most equity investors state that a ticket of at least $10 million is needed to attract their interest to a DBFOM project. Some ability to go below $10 million has been observed on closed P3 deals in Canada, as low as $5 million on the recently-closed Surrey Pretrial Services Centre Expansion DBFM.

While it is possible to reduce gearing below 90:10 on smaller projects to preserve the minimum equity ticket size, this increases the overall cost of private finance and reduces Value for Money. It also reduces the size of the debt ticket for a project, which is also subject to minimum investment criteria.

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5.2.2 BANK DEBT

Canadian banks do not currently provide long term debt to P3 projects. Foreign banks have provided long-term debt in club deals of relatively small individual ticket sizes, for example a total of $75 million in senior debt in a two-bank club deal on the recent Alberta Schools Alternative Procurement II (ASAP II). These banks may only have interest in maximum terms of 20 to 25 years. With water sector P3s often having a term of less than 30 years, there is potential for foreign bank interest in mid-sized water sector projects.

Canadian banks do have interest in shorter term "mini-perm" loans, but the firms most likely to lead consortiums in the water/wastewater sector would not likely utilize mini-perm debt solutions due to the refinancing risk that accompanies them.[20]

Banks generally prefer to lend to projects as part of a club deal involving two or more banks. The reasons for this is, in addition to liquidity and investment diversification, are cost sharing and risk mitigation. The cost of due diligence associated with the investment decision can be shared among club members, and in the event that the project encounters problems and the lenders need to step in, cost and effort can be shared and a greater resource base drawn from the club can be tapped. This has implications for project size, in that individual bank ticket sizes on club deals may not necessarily indicate bank willingness to invest similar ticket sizes on a standalone basis.

5.2.3 BOND DEBT

Bonds are the most likely source of long term third party debt for DBFOM projects based on recent market activity. There are, broadly, two types of bond debt available: credit-rated broadly marketed bonds and narrowly marketed/private placement bonds which are typically not credit-rated.

Rated broadly marketed bonds require an underwriter or bond dealer to undertake due diligence, have the project rated, and commit funds to the P3 consortium prior to selling the bonds to the ultimate bondholders. A minimum bond financing "ticket" is needed to attract the underwriter to a project. Rated bonds have been used on many Canadian P3s and have almost exclusively been for amounts over $100 million. As there may be many ultimate bondholders, a "club deal" of lenders is implied.

Narrowly marketed/private placement bonds have been used on a small number of Canadian P3 projects. The bond ticket sizes on these transactions have been as low as $41 million on the Surrey Pretrial project, which was taken by a single life insurance company on a standalone basis. Narrowly marketed/private placement debt is usually placed on a club basis, for the same reasons as noted above for banks. The Surrey Pretrial project may be the only Canadian P3 project to date with a private placement debt "club of one", but it does illustrate that projects below the $100 million rule of thumb can attract 90:10 style debt:equity financing.

5.2.4 CONCLUSIONS

It is difficult to draw hard and fast rules on the project size limitations for DBFOMs with third party debt. Each project is a special case in terms of its timing and other characteristics which can affect market interest. Generally, it appears that:

- DBFOMs with private finance amounts over $100 million will attract market interest similar to that which has been experienced in the broad Canadian P3 market over the past several years, with senior debt provided by rated and unrated bond solutions and possibly foreign banks. There is a strong track record of financings of this type. As noted in Section 2.2, projects that meet these thresholds are likely to be the exception rather than the rule.
- DBFOMs with private finance amounts in the $50 million to $100 million range may attract market interest as recently demonstrated on the Surrey Pretrial and ASAP II projects, with senior debt provided through unrated private placement bonds (likely with Canadian life insurance companies) and possibly foreign banks. A robust long term market interest in projects of this size has not yet been demonstrated.
- DBFOMs with private finance amounts less than $50 million are unlikely to attract market solutions consisting largely of third party debt.

[20] The bid teams for water sector P3s will likely be led by the water service specialty firms, which are not likely to be willing to take on the refinancing risk associated with mini-perm loans. This is in contrast to the hospital sector, for example, in which P3 bids are often led by financiers that are comfortable with refinancing risk due to the nature of their core expertise.

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5.3 DBFOM with Operator or Service Provider Provided Financing

Referring back to Table 6 (page 16), there have been a number of water/wastewater DBFOM projects in Canada, and all have been small, in the $10 million to $30 million range. These projects are much smaller than what will attract the typical equity plus third party debt financing solution.

The water/wastewater sector is different from the other sectors in that there is an existing market of highly specialized firms involved in design, Design-Build-Finance, and operation that depending on project size will finance a DBFOM project. The "utility-oriented" contractors in particular are in the business of investing funds with relatively modest overall rates of return, similar to returns allowed in the regulated utility space. In addition to the utility style firms, other water/wastewater specialty firms have the ability to invest small amounts of equity.

The advantage of operator or service provider provided financing is that it should be easier, faster, and less costly for the contractor to arrange. Arrangement, commitment, and other fees that are charged by third party lenders can be avoided or reduced. These contractors have core competency in the water/wastewater sector and therefore the cost of the contractor's own due diligence with respect to financing should also be significantly less than what third party lenders (who have no in-house sector expertise) would incur.

However, the third-party scrutiny that outside lenders bring is lost, which depending on the confidence the sponsor has in the contractor, could be a downside. Another concern is the cost of contractor-provided financing. We expect that the cost of capital in a contractor-financed DBFOM will be higher than a large DBFOM with 90:10 gearing and third-party debt.

5.3.1 SMALL PROJECTS

Relatively recent procurements demonstrate a market of willing participants for small DBFOM. On the Cavan-Millbrook project, which had a capital cost of approximately $30 million, there were at least five respondents to the 2007 RFQ for a DBFOM for new water and wastewater systems, which were shortlisted to:

- EPCOR;
- Genivar; and
- Teresen (now Corix).

On the Britannia project, which had a capital cost estimated at $18 million, there were six respondents to the 2004 RFEI (which was really an RFQ) for a DBFOM for the treatment plant, which were shortlisted to:

- AMEC/Ledcor;
- EPCOR; and
- Teresen (now Corix).

On the Taber project, which had a preliminary cost estimate for the wastewater treatment plant upgrade of approximately $30 million, there were three respondents shortlisted in 2007 for a DBFOM:

- EPCOR;
- Axor; and
- Corix.

The small DBFOM projects across Canada are likely to have robust competition. It is expected that participation would come from "utility-oriented" firms and other water/wastewater specialty firms.

5.3.2 MID-SIZED PROJECTS

While there are no examples of mid-sized Canadian DBFOM projects, between $30 and $200 million capital cost, this is not necessarily because there is no viable source of financing for such projects. It may simply reflect the fact that only small municipalities with correspondingly small projects, have been active in the DBFOM (and DBOM) space to date.

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If mid-sized projects are brought to market, participation in the procurement process could come from Canadian utility-oriented firms. The robustness of competition may depend on the entrance of other utility-oriented players (from the U.S. or U.K.). It is unlikely that the design-oriented firms or construction firms will provide contractor financing on the lower range of mid-sized projects. However, projects in the upper end of this range could potentially attract more traditional P3 consortiums with financing structures using private placement debt.

5.3.3 LARGE PROJECTS

There are also a limited number of large-sized Canadian DBFOM projects. The Capital Regional District (CRD) Biosolids Energy Centre project, for example, is estimated to have a capital cost of approximately $205 million. This project is part of the larger Core Area Waster Treatment Program (CAWTP) project with a total capital cost of $783 million. An RFQ has not been issued for the CRD Biosolids Energy Centre project, but a procurement information session was held on September 27, 2012.

5.4 Conclusion

The following table summarizes the assessment of the market for DBFOM as influenced by the financing component of the project structure. It should be noted that the boundaries between small, mid-sized, and large are difficult to precisely define and are likely to move over time with changes in the financial and service provider markets.

TABLE 8 Project Size and DBFOM Financing Characteristics

Project Size	Capital Cost Range ($ million)	Private Financing Requirement[a] ($ million)	Expected Competition Level	DBFOM Type	Gearing	Relative Cost of Private Finance
Large	200 plus	100 plus	Robust	Equity + third-party debt (private placement, rated bond, foreign bank)	± 90% debt	Lowest
Mid-sized	30 to 200	50 to 100	Untested, may be limited	Equity + third party debt (private placement bond)	Likely < 90% debt due to minimum equity ticket size	Mid-range due to gearing
		15 to 80	Untested, may be limited to utility-oriented firms	Contractor-financed	Balance sheet financing - larger size could allow for a notional debt:equity split with some portion having debt-like returns	Mid-range, tending to higher end
Small	< 30	5[b] to 30	Robust	Contractor-financed	Balance sheet - could be all equity	Highest

a - based on range of sponsor capital contribution between zero and 50%
b - minimum contractor financing ticket size could be smaller and may vary significantly between contractors

The unique nature of the service providers in the water/wastewater sector creates an opportunity to apply the DBFOM model to projects that are considerably smaller than in other sectors. The Value for Money proposition in small and mid-sized projects may have to contend with higher private financing costs than what has been enjoyed on large projects in other sectors. This may dictate that the sponsor make higher capital contributions than have typically been made, leading towards the "all equity" model described in Section 7.3.

While there appear to be a number of sources of financing for mid-ranged projects, the ability to attract sufficient competition to participate in procurement has not been proven in the market. The number of "utility-oriented" service companies with ability to self-finance projects is limited, and there have only been a small number of DBFM/DBFOM projects (in other sectors) in this size range financed with third party debt to date.

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6.0 Financing-related project size limitations for DBFOM

6.1 Introduction

The optimal allocation of risk between the sponsor and contractor, combined with the competitive procurement process, is what drives value in P3 delivery models. Unfortunately, many sponsors view P3s as an opportunity to unilaterally transfer risk from the public to the private sector, and do not have a strong appreciation or understanding of optimal risk allocation and sharing. This section (and its companion Appendix A) focuses on project risks that are unique to the water/wastewater sector and which have bearing on the ability to transfer risk and derive Value for Money from P3 delivery models. Table 9 outlines the broad transfer of responsibilities and risks in the DBF, DBOM, and DBFOM.

Risk allocation is guided by the tenet that a risk should be allocated to the party (i.e. sponsor or contractor) best able to mitigate it (i.e. the party that can best avoid, control, or reduce impacts). Risks that neither party can mitigate tend to fall to the sponsor or are shared.

6.2 Common Risk Allocations

Among the range of project types (i.e. water treatment, water networks, wastewater treatment, wastewater networks, and biosolids projects) there are commonalities with respect to the most likely optimal risk allocations. As with P3s in other sectors, the transfer of construction cost and schedule risk is nearly always transferred to take advantage of innovation in design and construction that is stimulated through competitive procurement. Facility sizing must generally be retained by the sponsor, except in rare cases where a project is fully standalone and without connection to existing systems. Regulatory change, since it is not under the control of the contractor, must generally be retained by the sponsor, however there are certain elements of regulatory compliance such as operator certification that are, and should be, transferred.

For treatment projects, including biosolids projects, the responsibility for the efficiency of the treatment process should be transferred in cases where the contractor has designed the treatment process (which should be the vast majority of such projects). If this risk is not transferred, contractors will have no motivation to optimize lifecycle costs, and could saddle the sponsor with significant overruns in the amount of chemicals and power used in the treatment process.

The approach to latent defects in existing infrastructure and geotechnical risk will vary, but in the end will nearly always end up being a shared risk. Latent defect risk may be transferred for assets that can be inspected (i.e. not buried assets), and geotechnical risk for projects in all sectors are usually shared.

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TABLE 9 Common Risk Allocations Across All Water/Wastewater Project Types

RISK	TYPICAL ALLOCATION
Construction Cost	Transferred
Construction Schedule	Transferred
Facility Sizing	Retained by sponsor
Permit Compliance	Transferred
Regulatory Change	Shared but mostly retained
Latent Defects In Existing Infrastructure	Buried assets: retained Above-ground assets: possibly shared
Geotechnical	Shared

In the sections below, risks that are unique to each project type are discussed. Appendix A contains an in-depth discussion of each risk for each type of project.

Appendix A contains a "risk rating" (high/medium/low), which reflect an assessment of the relative importance of the risk among other general project risks for a typical project. This is a guide only, and each project's risks must be evaluated on a case by case basis to determine the appropriate risk levels and risk allocation. The risk rating shown is from a high level project perspective, and does not assume any specific P3 model or risk allocation.

6.3 Water and Wastewater Network Project Risks

6.3.1 FACILITY SIZING RISK

Facility sizing (i.e. diameter of pipes, pump station capacities) must typically be retained by the sponsor as the flow passing through these facilities is not in the control of the contractor. An additional feature of sewer systems that makes transfer of sizing risk difficult is that extraneous flows[21] can make up a significant portion of sewer flows, and such flows are difficult even for municipalities to control. In addition, there is a potential for there to be a poor understanding of flow rates and volumes of extraneous flows.

6.3.2 GEOTECHNICAL RISK

Networks may traverse long distances and thus have widely varying geotechnical conditions. Depending on the spatial nature of the network being constructed, it may not be reasonable to fully allocate geotechnical risk to a P3 partner. A risk-sharing arrangement, based on conditions deviating from provided geotechnical information or other specific arrangement is likely needed.

Latent Defects in Existing Infrastructure

If the P3 arrangement includes the assumption of responsibility for existing infrastructure, the risk of defects in and performance of that infrastructure must generally be retained by the sponsor. There is considerable risk related to the condition, construction quality, and even the precise location of buried pipe networks that is not likely to be efficiently transferred in a P3 arrangement.

In the case where there are above-ground assets that can readily be inspected as part of the bidding process, e.g. pump stations, it may be possible to transfer latent defect risk. This should be evaluated on case by case basis - the condition and age of the assets may not lend themselves to risk transfer.

[21] Even well-constructed sewer systems receive water from unintended and undesirable sources. These "extraneous flows" include infiltration of groundwater through pipe joints and deteriorated pipe walls, and inflow of surface runoff through cross-connections to storm sewers and roof leaders. The significance of these flows depends on system initial quality and materials, system age, bylaw enforcement, and precipitation patterns.

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6.4 Water Treatment Project Risks

6.4.1 SOURCE WATER QUALITY

Source water quality, especially surface water, may vary in quality on a temporal basis due to seasonal changes, natural or man-made events in the watershed, etc. Regardless of delivery model, the design of a water treatment process requires the nature of the source water to be understood, and limits to be placed on the range of source water quality that the process is expected to be able to handle. This range is often referred to as a water quality "window". The window should reflect all reasonably-anticipated conditions, including seasonal variations and historically observed water quality.

Risk for the efficacy and cost-effectiveness of the water treatment process while the source water quality is within the window is transferred to the contractor. If the source water quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the water is the sponsor's responsibility.

A comprehensive historical water quality dataset is needed to set the water quality window. In the absence of this, regional comparisons to similar watersheds or aquifers may be needed. There may be a temptation to set the window wider for a P3 than a traditional project, and a small additional margin may be warranted to realize the "turnkey" benefits of the P3, but generally the water quality window should not be significantly different for different delivery models to ensure Value for Money.

6.4.2 SOURCE WATER AVAILABILITY

It may be theoretically possible to leave the selection of the source water (i.e. lake, river, aquifer) up to the private sector, but on a practical basis the water source will need to be determined and withdrawal permits secured prior to the procurement of a treatment facility. As the P3 partner will not have been involved in source selection and cannot influence the availability of water in the environment or the usage of water in the system, this risk must be retained by the sponsor.

6.4.3 TREATED WATER QUALITY

The other fundamental performance specification for a water treatment plant is the treated water quality. The treated water quality specification will typically be a combination of provincial requirements and federal guidelines and regulations. The risk of meeting the water quality specification can be transferred to the contractor because it is given full control over the treatment process selection and accompanying plant design. The only caveat is that risk becomes shared if the source water quality deteriorates beyond the limits of the source water quality window.

In practice, the private sector may not be given full and unfettered freedom to select the treatment process. For DBF, where the contractor has no long term obligation, a sponsor will typically either limit the allowable process technologies or have a process approval role to protect its interest in ensuring the long term viability of the process.[22] In a DBO, where there is a long term contractor obligation but the quality of the long term security is not the strongest, a sponsor may take similar measures or at least require that a process be proven elsewhere. In a DBFOM, the greatest freedom can be offered to proponents because the financing secures the long term risk transfer.

6.4.4 DRINKING WATER REGULATOR APPROVAL

In addition to the usual permits and approvals associated with a construction project, treatment plants typically require approval of the drinking water regulator (e.g. Health Authorities in BC, Ministry of Environment in Ontario, etc.) before construction. These approvals are specific to the treatment plant designs and the risk must therefore be transferred to the private sector.

[22] The "progressive design build" delivery model identified earlier is even more consultative between the sponsor and contractor.

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6.5 Wastewater Treatment Project Risks

6.5.1 INFLUENT QUALITY

The quality of the influent to a treatment plant is not in the control of the private sector. Sewage strength will vary on a temporal basis due to seasonal changes in extraneous flow, and through the introduction of various permitted and banned substances to the system by connected properties. Regardless of delivery model, the design of a wastewater treatment process requires the nature of the influent to be understood, and limits to be placed on the range of influent quality that the process is expected to be able to handle. This range is often referred to as an influent quality "window". The window should reflect all reasonably-anticipated conditions, including seasonal variations and historically observed influent quality.

Risk for the efficacy and cost-effectiveness of the wastewater treatment process, while the influent quality is within the window, is transferred to the private sector. If the influent water quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the water is the sponsors' responsibility.

A comprehensive historical wastewater quality dataset is needed to set the influent quality window. For new land development, typical wastewater characterizations will have to be used. There may be a temptation to set the window wider for a P3 than a traditional project, and a small additional margin may be warranted to realize the "turnkey" benefits of the P3, but generally the influent quality window should not be significantly different for different delivery models.

6.5.2 FACILITY SIZING

The quantity of influent expected to be handled by the treatment plant is not in the control of the private sector, and may be influenced by municipal activities under the sewer use bylaw and by water pricing (lower water use = less sewage), and by extraneous flows. Therefore, it is generally necessary for the sponsor to specify the size (i.e. capacity) of wastewater treatment facilities. There is some risk in facility sizing, as there is potential to oversize and over-invest, or to underbuild and require sooner than optimal expansion.

Included in facility sizing for a wastewater treatment plant is specification of bypass flows (i.e. in the event of weather events beyond the design level) that do not get treated. The risk associated with bypassing is retained to the extent that the reason is weather-related and not caused by the P3 partner's operation of the plant.

6.5.3 EFFLUENT QUALITY

The other fundamental performance specification for a wastewater treatment plant is the treated wastewater, or effluent, quality. The effluent quality will typically be dictated by a system-specific permit. The risk of meeting the effluent quality specification can be transferred to the private sector because it is given full control over the treatment process selection and accompanying plant design. The only caveat is that risk becomes shared if the influent quality deteriorates beyond the limits of the influent quality window. In practice, effluent quality is a significant risk for the proponent where there is considerable influent quality variability given the implication of potentially not meeting the required output specifications dictated in the project agreement.

In practice, the private sector may not be given full and unfettered freedom to select the treatment process. For DBF, where the private sector has no long term obligation, a sponsor will typically either limit the allowable process technologies or have a process approval role to protect its interest in ensuring the long term viability of the process.[23] In a DBO, where there is a long term contractor obligation but the quality of the long term security is not the strongest, an sponsor may take similar measures or at least require that a process be proven elsewhere. In a DBFOM, the greatest freedom can be offered to the private sector because the financing secures the long term risk transfer.

[23] The "progressive design build" delivery model identified earlier is even more consultative between the sponsor and contractor.

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6.5.4 METHOD OF DISPOSAL

Almost universally, wastewater treatment plants are located adjacent to the ultimate site of disposal to the environment, and the method of disposal (to river, lake, groundwater, etc.) is dictated by geography. The emerging potential for effluent reuse creates the possibility that the private sector may wish to sell effluent or treat it to a higher standard for economic gain. Allowing the private sector to select disposal methods could therefore result in proposals with different risk profiles. Generally, the disposal method should be prescribed by the sponsor.

6.6 Biosolids Processing Project Risks

6.6.1 SLUDGE QUALITY

The input to a biosolids processing facility is the solids stream output of the wastewater treatment process, namely sludge. Sludge is not suitable for discharge to the environment or beneficial use without further processing to remove water and reduce pathogens - hence the need to process it into "biosolids". The quality of the sludge received by the biosolids processing facility is not under the control of the P3 partner. Water and pathogen content are dictated by the wastewater treatment process, which for this discussion is assumed to be the responsibility the sponsor. Therefore, a sludge quality "window" for the incoming solids stream is needed for a biosolids plant.

Risk for the efficacy and cost-effectiveness of biosolids processing, while the sludge quality is within the window, is transferred to the P3 partner. If the sludge quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the sludge is the sponsor's responsibility.

6.6.2 INTERFACE RISKS

A biosolids processing facility will typically return the water extracted from the sludge to the wastewater treatment plant. Managing what is accepted from the wastewater treatment plant, and returned to the wastewater treatment plant, creates an "interface risk". Overall optimization of the wastewater treatment + biosolids processing may require the cooperation and integration of the operators of each element of the wastewater treatment process. Interface risk is likely to be best managed by sharing the risk to encourage cooperation.

6.6.3 BIOSOLIDS QUALITY

The other fundamental performance specification for a biosolids processing facility is the quality of the biosolids residual (i.e. the treated sludge) created by the facility. The biosolids residual quality is likely to be dictated by regulation, depending on the intended disposal method (e.g. landfilling, incineration, land application, energy recovery, etc.). This risk is transferred to the private sector subject to the sludge quality being within the specified window.

6.6.4 METHOD OF DISPOSAL

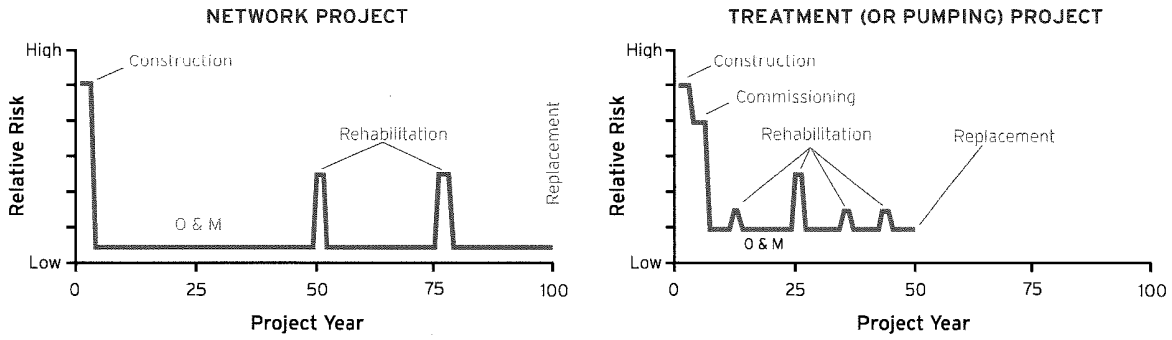
There are various means of disposing of biosolids residuals, such as landfilling, incineration, or land application. Generally, the responsibility (and risk) of selecting the disposal method should be retained by the sponsor. Otherwise, proposals from the private sector could present significantly different risk profiles through differing exposures to regulatory change (which is also a retained risk).

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6.7 Timing of Risk Exposure

The timing of risk exposure on a project is germane to assessing the need for contractor security. The needs are different for network and treatment projects as illustrated conceptually below.

FIGURE 1 Examples of Operating DBOM Projects



Network projects are likely to have a longer life, and pipeline rehabilitation requirements are likely beyond the term of a P3 operation period. Risk, and the need for performance security, is primarily during the construction period as there should be little handback risk faced by the sponsor. O&M risk is relatively low.

Treatment projects have shorter lives and more frequent rehabilitation requirements for electrical and mechanical equipment. A number of elements of water and wastewater treatment equipment have useful lives of approximately 20 years, so consideration and caution should be given to the structuring of agreements that align in duration with this timeframe. Where handback provisions are expressly contemplated, sponsors should consider extending the timeframe of the P3 agreement to a duration of more than 20 years so that proponents can adequately plan for capital rehabilitation of equipment during the O&M phase of the project. Performance security is desirable for the construction and commissioning period to ensure that the sponsor is protected until acceptance and/or performance standards are being met. Ongoing O&M risk is higher than network projects, and the need to rehabilitate and replace major components creates handback risk for the sponsor. Performance security is desirable for the operating period to project the sponsor from ongoing O&M and handback risk.

Some consideration should also be given to the private sector's concern regarding long term commitments as it relates to O&M costs. In forecasting O&M costs, a number of economic conditions and technical assumptions are modeled - which may materially change throughout the performance of the long-term agreement. Methodologies such as benchmarking or scheduled project reviews may provide a degree of flexibility to re-evaluate the original economic and technical assumptions, however, caution must be exercised with such approaches to maintain the risk transfer and value proposition of the P3.

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7.0 Applicability of P3 models to Canada

7.1 Introduction

As summarized in Section 3, there has been some municipal application of P3 models on water/wastewater projects in Canada, and in fact one of Canada's earliest P3s was a water treatment DBFOM. Overall though, P3 in the sector has been very limited, meaning that municipal sponsors have been delivering projects almost exclusively through Design-Bid-Build. The past use of Design-Bid-Build is in most cases not the result of an examination of alternatives, but rather is simply the default approach - so the lack of P3 examples is not necessarily an indication of unsuitability.

This section examines the potential for P3 models to play a role in the water/wastewater sector and considers how the models may need improvement or modification to suit the unique nature of the water/wastewater project pipeline.

7.2 Enhance Long Term Security on DBOM Projects

Enhancing the long term security of a DBOM can be achieved by having contractor financing, and in some cases through letters of credit. The "all equity" DBFOM described below could be considered an enhanced-security DBOM because the amount of financing is relatively small.

7.3 DBFOM with Reduced Financing Costs

As shown on Table 8, the cost of private financing is expected to be higher on small and mid-sized projects as compared to what has been experienced on DBFOM and DBFM projects (in other sectors) in Canada to date. This will make it more difficult for small and mid-sized projects to demonstrate Value for Money. The cost of private financing can be mitigated in two ways: reduce the amount of financing in the project, or shorten the operating period.

7.3.1 AMOUNT AND TIMING OF CAPITAL CONTRIBUTION

The amount of private financing can be reduced by increasing the capital contribution made by the sponsor to the project. While capital contributions are the norm in current market conditions, they have not always been used. If the capital contribution is made too large, the attractiveness of the transaction to the market may be impacted, and the risk transfer may be compromised if the private investment is too small of a fraction of the capital cost. The amount of capital contribution is the major determinant of private financing costs.

The timing of the payments to the P3 partner has an effect on the P3 partner's carrying costs during construction, therefore the use of milestone payments rather than a single substantial completion payment will reduce financing costs as well. The timing of capital contributions has a relatively minor impact on overall private financing costs.

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7.3.2 ALL EQUITY DBFOM

The all equity model entails the sponsor making a much higher capital contribution than would be done under a traditional DBFOM with third party debt, effectively eliminating the role of third party debt in the deal structure. The expectation in such a model is that all of the private financing will be equity.[24] An 80% capital contribution leaving 20% for private financing was used on two BC hospital DBFMs during the height of the 2008-2009 credit crisis. On these projects, the 20% equity financing was not believed to provide sufficient security on its own, so security requirements similar to those typically required by lenders (i.e. parent guarantees and performance bonds) were put in place for the construction and operation periods.

The advantage of an all-equity DBFOM over a DBOM is that the P3 partner has the additional performance incentive that comes from having capital at risk. This provides the sponsor with improved long term security.

An all-equity structure is inferior to a DBFOM with third party debt as it does not enjoy the benefits of the lenders' initial due diligence, and does not have the backstop offered by a lender with step-in rights to take over the project and solve performance problems should the contractor not perform.

In addition, the capital payments associated with a small financing may not provide enough capital, if held back by the sponsor, to rectify handback deficiencies. To partially mitigate this, the capital payment profile could be sculpted such that payment over the last few years of the term is more significant than the preceding years.

The market's view of the attractiveness of all-equity projects is expected to be mixed, with greatest favour held by the utility-oriented firms and water service companies. Some financially-oriented P3 developers favour all-equity projects, while some do not.[25]

7.3.3 SHORTER OPERATING TERM

A shorter operating term amortizes the private financing faster, reducing the total cost of financing. Operating terms are often shorter in the water/wastewater sector than the 30 year Canadian P3 standard. The Britannia water treatment DBFOM has a 20-year term.

Shorter terms may reduce the level of consideration given to lifecycle costs by the design solution.

7.3.4 SHORTER TERM ALL-EQUITY DBFOM

For projects that strategically and qualitatively would be well-served by the DBFOM model but that do not initially demonstrate Value for Money, exploring combinations of shorter terms and all-equity financing may reveal a structure that meets the sponsor's key objectives and demonstrates quantitative value. We expect that this will be most applicable on smaller projects in smaller municipalities that have limited in-house resources and capabilities.

This structure conceptually sits between DBO and DBFOM on the spectrum, in terms of the amount of risk transfer and quality of the long term security.

[24] The "wide equity" DBFM project structure used on two hospital projects in BC was more complex than simply making a high capital contribution. It entailed the sponsor (i.e. the Province of BC) notionally acting as a lender to the project with notional debt service coverage requirements and equity tail requirement.

[25] Reasons for not favouring all-equity deals include additional pressure on equity returns since there is no third-party lender dictating debt service coverage ratios, limited ability to recover development costs early since there is no lender to fund costs upfront, and higher due diligence costs since there is no lender to share costs with.

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7.4 Bundling

Bundling projects together to achieve minimum project size objectives and reduce individual project procurement costs could improve the Value for Money demonstrated by the projects if procured separately. Bundling of a single sponsor's projects should be relatively straightforward, especially where the projects and the optimum delivery model are similar.

Bundling several projects belonging to multiple sponsors may be very challenging, requiring a governance structure that will be time consuming to develop and raising potentially insurmountable complexities both for the sponsors and the P3 partner and its lenders.

BUNDLING OF FIRST NATIONS PROJECTS

First Nations water/wastewater projects, being reflective of community size, are typically very small. Size aside, these communities could benefit from the efficiencies, competition, and risk transfer that P3 delivery models offer. In particular, the shortage of qualified water/wastewater operating staff in First Nations communities could potentially be well addressed by the O&M components of P3 delivery models. Bundling of individual First Nations projects into larger P3 projects is an obvious opportunity.

As with any P3 project, whether or not value will be delivered by a P3 approach must be examined on a project-specific (or in this case, bundle-specific) basis. Challenges to obtaining value from a bundled approach for First Nations projects stem from geographic challenges (are projects close enough together to allow contractor economies in design, construction, and operations and maintenance, are projects so remote that they cannot cost-effectively be serviced by a centralized model, etc.) and governance challenges (the contractor needs a single counterparty to perform effectively, yet each community may want project control).

The governance challenges noted above will be prominent and limiting unless an over-arching project governance structure can be put in place that obviates the need for the P3 partner to deal with each individual community for procurement, payment, performance reporting, and contract management.

7.5 Combined Delivery Models

Subcomponents of a large project may have very different risk profiles and operation and maintenance requirements. Therefore, the optimum delivery model could be different for each subcomponent. An obvious example is a project consisting of both a treatment component and a network component. In such cases, a hybrid model combining two different delivery models (such as DBFOM for the treatment component and DBF or DBOM for the network component) within a single procurement process may warrant examination.

7.6 Summary

DBF, DBOM, and DBFOM models are all suitable for use on Canadian water and wastewater projects, subject to the specifics of each project and each sponsor being taken into account. The DBFOM model should bring the benefits experienced in other sectors, although on small and mid-sized projects some changes to the level of private investment and project operating term may be necessary to accommodate what is expected to be a higher cost of private capital.

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8.0 Summary of opportunities and impediments for water/wastewater P3 models

8.1 The P3 Opportunity

There exists a tremendous opportunity in Canada to apply the P3 model in the water/wastewater sector. Since most projects will not be large greenfield opportunities as have been enjoyed in the broad Canadian P3 market to date, each project opportunity will need to be scrutinized individually to determine if DBFOM can apply. In addition, the model is most likely to demonstrate value on treatment, rather than network projects. The ability to package operations, not just maintenance, in the contractor's scope suggests that there is a broader scope for innovation and value-generation than there is on DBFM projects.

The marketability of mid-sized projects shows promise, based on the interests of the "utility-oriented" water/wastewater service firms and some recent P3 activity in the social infrastructure sector. The only way to understand if there will be an appetite to efficiently finance mid-sized projects will be to take one through the business case process, with a heavy emphasis on financing market sounding, and then take the project to market. The marketability of small projects has been tested, and large projects should be as marketable as large projects have been in other sectors.

In cases where a typical DBFOM deal structure does not demonstrate Value for Money, consideration of shorter operation periods and all-equity financing may make DBFOM viable – as long as the negative impacts of the smaller financing ticket and shorter operating period are taken into consideration alongside the positive impact of reduced financing costs. An all-equity and/or shorter term DBFOM could be an improvement over DBOM.

DBOM is also considered an improvement over DBF (which as a result of the exclusion of operating and maintenance components may not meet PPP Canada's investment objectives). DBOM is a viable model but does not provide as strong risk transfer and depends largely on company guarantees for their long term performance security.

8.2 Potential Impediments

Following are some potential impediments to the use of the various P3 models. These impediments are project-specific, and depend on the scope, timing, location, jurisdiction, and sponsor of each opportunity. Broadly speaking, none of these impediments are considered fatal to a P3 delivery model in the water/wastewater sector – they are merely project-specific considerations – and could be considered project screening criteria.

8.2.1 PUBLIC AWARENESS

P3 is still a relatively new framework for the Canadian market, including the water/wastewater sector. The value of private sector involvement has traditionally been well recognized and accepted in the design and construction of municipal, provincial and federal infrastructure of all types, including water/wastewater projects. However, public concern often arises from private sector involvement in the operating and financing components of a P3 project as many Canadians are not familiar with P3s and do not understand the roles and responsibilities of public and private partners. The main misconception with P3s is that infrastructure assets, along with the associated natural resources are owned by the private sector, which results in public opposition to P3s, especially in the water/wastewater sector.

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In reality, P3s use a project agreement structure where ownership of the infrastructure remains with the government and the operations and maintenance of the infrastructure asset reverts to the government at the term of the contract. In addition, the public sector maintains accountability for each project through a performance-based contract to ensure high-quality standards are met throughout the life of the contract. This provides the public sector with assurances that they can hold the private partner accountable for poor performance. As a result, the government retains full control of the outcomes of the project.

Awareness at all levels of a project, must be gauged early and managed appropriately. The role of accurate communication and education through salient, evidence-based benefits that P3s may bring to a project is crucial in promoting a P3 implementation. As service providers are very tuned-in to this risk, and are often looking for a strong political commitment to support the feasibility of a P3 opportunity, it is very important that this risk be mitigated as completely as possible prior to a transaction being launched.

8.2.2 PROJECT SIZE (AMOUNT OF PRIVATE FINANCING)

The expected "pipeline" of water/wastewater sector projects in Canada consists of a handful of large projects with capital cost of over $200 million, with most projects being mid-sized. Project size is not an issue for DBF or DBOM delivery models, but may be an impediment for DBFOM on mid-sized projects where the interest and ability of the market to fund smaller debt requirements is untested.

8.2.3 COST OF PRIVATE FINANCING

Private financing spreads exceed those of the public sector. Macroeconomic externalities, such as the 2008 credit crisis, can further exacerbate the cost of private financing on P3 projects when compared to the cost of public funds, ultimately making it more difficult for DBFOM P3s to demonstrate Value for Money. While private financing spreads have since decreased from 2008 crisis levels, and while this is less of a concern for larger projects, sponsors must still be cognizant of the relationship between private financing and risk transfer.

The other consideration as it relates to private financing is the associated financing fees (which are typically paid upfront, and in addition to the interest and principal repayment), which have a proportionally greater impact on smaller projects when calculating Value for Money. Alternate P3 structures can be explored on a project-by-project basis in these scenarios (i.e. all-equity DBFOM and shorter operating terms) in order to maintain a sufficient level of capital at risk, while minimizing associated financing fees and costs.

8.2.4 MUNICIPAL COUNTERPARTY RISK

Most P3s in Canada have been provincially-backed projects, with some recent activity in federally-backed projects. Compared to the federal and provincial governments, municipalities have limited means of revenue generation, and as noted earlier, water/wastewater rates may not cover the full cost of service. It remains to be seen how the market regards the risk of providing long term financing to municipal projects.

8.2.5 MUNICIPAL AWARENESS AND RESOURCES

Few municipalities have in-house resources experienced with P3 procurements. In contrast, many municipalities have significant and experienced water/wastewater utility operations departments. In such cases, the balance of resources in-house could be expected to propagate traditional procurement as it utilizes existing resources in ways consistent with historical practice.

Through the efforts of PPP Canada, whose main objective is to improve the delivery of public infrastructure by achieving better value, timeliness and accountability to taxpayers, through P3s, awareness of P3 delivery models and their potential benefits is improving. Awareness is an obvious but crucial step in sponsors examining the potential for P3 project delivery.

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8.2.6 BROWNFIELD PROJECTS LESS SUITABLE

Many potential project opportunities are expected to be brownfield projects in which the latent defect risk in the existing infrastructure is not likely transferrable to the contractor. The extent to which the existing infrastructure influences the project scope, and the extent to which it can be inspected or tested, will dictate whether or not this prevents Value for Money from being demonstrated. On a qualitative level, it may not be worth the effort for a municipality to undertake a P3 procurement if it is not getting a true turnkey project with full asset risk transfer.

8.2.7 NETWORK PROJECTS LESS SUITABLE

Network projects with limited operating responsibility and lifecycle risk are not likely to demonstrate Value for Money as DBFOM, as there is little benefit of risk transfer within the term of the P3 to offset the incremental cost of private financing. DBF and DBO models may be appropriate for network projects.

8.2.8 REMOTE PROJECTS MAY BE LESS MARKETABLE

Remote projects may be expensive to bid (due to cost of access), are likely to be small, and may limit the potential for innovation and/or economies of scale that bidders can apply. Such opportunities may not be appealing enough to the market to make for a competitive procurement process.

8.3 Overall Conclusions

The following overall conclusions are presented in the context of the pipeline of applications for project support that PPP Canada expects to see over the next several years. In all cases, the specific and unique details of each project must be considered to arrive at the optimal delivery model.

1. A small number of large projects can be expected, which are similar in size to the recent pipeline of Canadian social infrastructure P3 projects and for which attracting cost-effective private financing should not be a concern. The DBFOM model as applied to other infrastructure sectors should be readily applicable.
2. A much larger number of mid-sized projects can be expected. The DBFOM model shows promise, although the financing of such projects is as-yet untested. The DBFOM model with debt and equity financing should be applicable. In some circumstances, the all-equity DBFOM and DBOM models should be considered
3. There are a large number of small projects, many of which may be in remote locations. These projects may be too remote for operations and maintenance to be practical and value-additive in a P3, in which case standard DBOM and DBFOM models are not applicable. In such cases, models with an improved performance guarantee should be given consideration.
4. There is a need for open dialogue with the private sector to properly communicate project objectives and expectations. A balance needs to be struck between procurement regulations and providing interested parties with adequate information through constructive dialogue during the procurement phase to facilitate the development of robust, innovative, comprehensive and competitive proposals.
5. Involving environmental regulators in the RFQ and RFP phases of projects may be especially valuable, along with ensuring that environmental assessments provide directives and requirements that are performance-based rather than prescriptive to foster innovative proposals.

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APPENDIX A

Discussion of key water/wastewater sector project risks

1. Introduction

The optimal allocation of risk between the sponsor and contractor, combined with the competitive procurement process, is what drives value in P3 delivery models. There are many general project risks that affect projects of all types in all sectors, e.g., funding approvals, affordability, construction cost overrun, construction time overrun, etc. that are not discussed here. Rather, this section identifies project risks that are unique to the water/wastewater sector and which have bearing on the ability to transfer risk and derive Value for Money from P3 delivery models.

Risk allocation is guided by the tenet that a risk should be allocated to the party (i.e. sponsor or contractor) best able to mitigate it (i.e. the party that can best avoid, control, or reduce impacts). Risks that neither party can mitigate tend to fall to the sponsor or are shared.

In the tables below a "risk rating" is provided (high/medium/low) which reflect our assessment of the relative importance of the risk among other general project risks, for a typical project. This is a guide only, and each project's risks must be evaluated on a case by case basis to determine the appropriate risk levels and risk allocation. The risk rating shown is from the high level project perspective, and does not assume any specific P3 model or risk allocation.

2. Water Treatment

2.1 ALLOCATION OF KEY RISKS FOR WATER TREATMENT PROJECTS

RISK	TYPICAL ALLOCATION	RISK RATING
Source water quality	Within window: transferred Outside window: retained	Medium
Source water availability	Retained	Low
Facility sizing	Retained	Low
Treated water quality	Transferred	Medium
Process efficiency	Transferred	Medium
Drinking Water Regulator Approval	Transferred	Low
Permit Compliance	Transferred	Low
Regulatory change	Shared but primarily retained	Medium
Latent defects	Shared	Medium
Geotechnical	Transferred	Low

2.2 SOURCE WATER QUALITY

Source water quality, especially surface water, may vary in quality on a temporal basis due to seasonal changes, natural or man-made events in the watershed, etc. Regardless of delivery model, the design of a water treatment process requires the nature of the source water to be understood, and limits to be placed on the range of source water quality that the process is expected to be able to handle. This range is often referred to as a water quality "window". The window should reflect all reasonably-anticipated conditions, including seasonal variations and historically observed water quality.

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Risk for the efficacy and cost-effectiveness of the water treatment process while the source water quality is within the window is transferred to the contractor. If the source water quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the water is the sponsors' responsibility.

A comprehensive historical water quality dataset is needed to set the water quality window. In the absence of this, regional comparisons to similar watersheds or aquifers may be needed. There may be a temptation to set the window wider for a P3 than a traditional project, and a small additional margin may be warranted to realize the "turnkey" benefits of the P3, but generally the water quality window should not be significantly different for different delivery models.

2.3 SOURCE WATER AVAILABILITY

It may be theoretically possible to leave the selection of the source water (i.e. lake, river, aquifer) up to proponents, but on a practical basis the water source will need to be determined and withdrawal permits secured prior to the procurement of a treatment facility. As the contractor will not have been involved in source selection and cannot influence the availability of water in the environment or the usage of water in the system, this risk must be retained by the sponsor.

2.4 FACILITY SIZING

Water treatment facilities are sized to meet water demand, which may change over time (typically demand is expected to increase due to population growth). Demand is influenced by pricing, demand management, population growth and planning - all of which are the purview of the municipality and not proponents or contractors. Therefore, it is generally necessary for the sponsor to specify the size (i.e. capacity, usually Maximum Day Demand) of water treatment facilities. There is some risk in facility sizing, as there is potential to oversize and over-invest, or to underbuild and require sooner than optimal expansion.

Plant capacity is one of two fundamental performance specifications for a water treatment plant.

2.5 TREATED WATER QUALITY

The other fundamental performance specification for a water treatment plant is the treated water quality. The treated water quality specification will typically be a combination of provincial requirements and federal guidelines. The risk of meeting the water quality specification can be transferred to the contractor because it is given full control over the treatment process selection and accompanying plant design. The only caveat is that risk becomes shared if the source water quality deteriorates beyond the limits of the source water quality window.

In practice, proponents may not be given full and unfettered freedom to select the treatment process. For DBF, where the contractor has no long term obligation, a sponsor will typically either limit the allowable process technologies or have a process approval role to protect its interest in ensuring the long term viability of the process.[26] In a DBO, where there is a long term contractor obligation but the quality of the long term security is not the strongest, an sponsor may take similar measures or at least require that a process be proven elsewhere. In a DBFOM, the greatest freedom can be offered to proponents because the financing secures the long term risk transfer.

2.6 TREATMENT PROCESS EFFICIENCY

A water treatment plant is essentially a big machine. Relative to more passive types of assets, operating costs can be high. Inputs include items such as treatment chemicals and electrical power. Transferring process efficiency risk to the contractor ensures that operating efficiency (a key element of overall lifecycle cost) is given due attention in proponents designs.

Because the contractor does not control the price of inputs or the water demand, this risk is typically transferred by making the contractor responsible for any quantity of over-consumption, relative to a benchmark efficiency included in its bid. The benchmark efficiency would be used to calculate the net present value of the bid for purposes of awarding the contract, thus putting competitive tension on the bid efficiency of the plant. If, once operational, the plant uses more of an input per unit of treated water than the bid indicated, the contractor would be required to cover the additional cost.

[26] The "progressive design build" delivery model identified earlier is even more consultative between the sponsor and contractor.

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2.7 DRINKING WATER REGULATOR APPROVAL

In addition to the usual permits and approvals associated with a construction project, treatment plants typically require approval of the drinking water regulator (e.g. Health Authorities in BC, Ministry of Environment in Ontario, AANDC in First Nations communities, etc.) before construction. These approvals are specific to the treatment plant designs and the risk must therefore be transferred to the contractor.

2.8 PERMIT COMPLIANCE

Depending on jurisdiction, permits/licences/certificates of approval (collectively, "permits") may be issued for water systems overall and/or for specific water treatment plants. The risk of compliance with permit conditions related to the operation of the treatment plant should be transferred, as the ability to comply is related to the design and operation of the plant, which are in the contractor's control.

In some jurisdictions, permits expire on a regular basis (e.g. in Ontario, the water-system-wide Municipal Drinking Water Licence expires after five years). The contractor should be transferred the responsibility for contributing to permit renewals for the infrastructure under contract, to the extent that such renewals are not a change in regulation (see below). Typically this contribution will be a documentation exercise.

2.9 REGULATORY CHANGE

Regulatory requirements for treatment plants are typically more significant than for networks because the treatment plant is the major determinant of the quality of drinking water consumed by the population (distribution networks do have some influence, but on a considerably lower number of water quality parameters). Of primary concern in terms of regulatory change is the addition of previously unregulated contaminants, or the lowering of allowable contaminant levels for currently regulated contaminants. In either of these cases, changes to regulations are known to the industry long in advance. Another area of potential concern is the disposal of water treatment residuals, the waste by-products of the treatment process. Typically these are landfilled. There is the potential for restriction on disposal methods to be imposed by regulatory agencies.

Broadly, since the risk of regulatory change is not within the control of the contractor, the risk must be retained. However, there are some sub-risks in this category that may be transferred as the cost impacts should be low and a qualified contractor should be able to mitigate the impacts. Again, an example is the risk of operator certification requirements changing. Another example are changes in permits that the regulator makes in response to the performance of the contractor, such as stepping up sampling and reporting requirements due to earlier noncompliance.

2.10 LATENT DEFECTS IN EXISTING INFRASTRUCTURE

If the P3 arrangement includes the assumption of responsibility for an existing plant, such as in an expansion or treatment process upgrade, the risk of defects in that infrastructure must generally be retained by the sponsor. Risk for elements of the treatment plant that can be readily inspected as part of the bidding process can likely be transferred, and a considerable portion of a water treatment plant will fall into this category. However, there is often significant below-grade tankage that may be difficult or impossible to fully inspect. Overall, latent defect risk for an existing plant will at best be a shared risk.

2.11 GEOTECHNICAL RISK

Transfer of geotechnical risk for a water treatment plant is desirable because the design of the plant may depend significantly on geotechnical conditions and there may be considerable scope for innovation in the handling of geotechnical conditions. Given that a treatment plant is confined within a well-defined site, the risk of widely varying conditions that cannot be detected through a site investigation program is low, compared to pipelines. And, allowing proponents access to do their own additional geotechnical investigation should they desire should be practical in most cases.

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3. Wastewater Networks

3.1 ALLOCATION OF KEY RISKS FOR WASTEWATER NETWORK PROJECTS

RISK	TYPICAL ALLOCATION	RISK RATING
Facility Sizing	Retained	Medium
Permit Compliance	Transferred	Low
Regulatory Change	Shared but mostly retained	Low
Latent Defects In Existing Infrastructure	Buried assets: retained	High
	Above-ground assets: possibly shared	Medium
Geotechnical	Shared	Medium

3.2 FACILITY SIZING RISK

Facility sizing (i.e. diameter of pipes, pump station capacities) must typically be retained by the sponsor for reasons very similar to those listed for water network infrastructure. An additional feature of sewer systems that makes transfer of sizing risk difficult is that extraneous flows[27] can make up a significant portion of sewer flows, and such flows are difficult even for municipalities to control. In addition, there is a potential for there to be a poor understanding of flow rates and volumes of extraneous flows.

3.3 PERMIT COMPLIANCE

Depending on jurisdiction, permits/licences/certificates of approval (collectively, "permits") may be issued for wastewater systems overall and/or for specific network elements. The risk of compliance with permit conditions related to the operation of the network should be transferred, as the ability to comply is related to its design and operation, which are in the contractor's control.

In some jurisdictions, permits expire on a regular basis (e.g. in Nova Scotia, the Approval expires after ten years). The contractor should be transferred the responsibility for contributing to permit renewals for the infrastructure under contract, to the extent that such renewals are not a change in regulation (see below). Typically this will be a documentation exercise.

3.4 REGULATORY CHANGE

Regulatory requirements for sewer systems are very minor. Areas of influence include operator certification requirements, and restrictions on sanitary sewer overflows and combined sewer overflows. The latter two items are primarily a function of system sizing, and as such are risks that must be retained by the sponsor to the extent that overflows do not stem from contractor operational error.

Overall, the risk of regulatory change should be retained because the contractor has no influence over the actions of the regulator, but there are some sub-risks in this category that may be transferred as the cost impacts should be low and a qualified contractor should be able to mitigate the impacts - operator certification being the most obvious example. Another example are changes in permits that the regulator makes in response to the performance of the contractor, such as stepping up sampling and reporting requirements due to earlier noncompliance.

3.5 LATENT DEFECTS IN EXISTING INFRASTRUCTURE

If the P3 arrangement includes the assumption of responsibility for existing infrastructure, the risk of defects in and performance of that infrastructure must generally be retained by the sponsor. There is considerable risk related to the condition, construction quality, and even the precise location of buried pipe networks that is not likely to be efficiently transferred in a P3 arrangement.

[27] Even well-constructed sewer systems receive water from unintended and undesirable sources. These "extraneous flows" include infiltration of groundwater through pipe joints and deteriorated pipe walls, and inflow of surface runoff through cross-connections to storm sewers and roof leaders. The significance of these flows depends on system initial quality and materials, system age, bylaw enforcement, and precipitation patterns.

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In the case where there are above-ground assets that can readily be inspected as part of the bidding process, e.g. pump stations, it may be possible to transfer latent defect risk. This should be evaluated on case by case basis - the condition and age of the assets may not lend themselves to risk transfer.

3.6 GEOTECHNICAL RISK

Networks may traverse long distances and thus have widely varying geotechnical conditions. Depending on the spatial nature of the network being constructed, it may not be reasonable to fully allocate geotechnical risk to a P3 partner. A risk-sharing arrangement, based on conditions deviating from provided geotechnical information or other specific arrangement is likely needed.

4. Wastewater Treatment

4.1 ALLOCATION OF KEY RISKS FOR WASTEWATER TREATMENT PROJECTS

RISK	TYPICAL ALLOCATION	RISK RATING
Influent quality	Within window: transferred Outside window: retained	Medium
Influent quantity	Retained	Low
Facility sizing	Retained	Medium
Effluent quality	Transferred	Medium
Method of disposal	Retained	Low
Process efficiency	Transferred	Medium
Disposal Method / Discharge Approval	Shared (bypass flows etc. may have to be retained)	Low
Regulatory change	Shared but primarily retained	Medium
Latent defects	Shared	Medium
Geotechnical	Transferred	Low

4.2 INFLUENT QUALITY

The quality of the influent to a treatment plant is not in the control of the contractor. Sewage strength will vary on a temporal basis due to seasonal changes in extraneous flow, and through the introduction of various permitted and banned substances to the system by connected properties. Regardless of delivery model, the design of a wastewater treatment process requires the nature of the influent to be understood, and limits to be placed on the range of influent quality that the process is expected to be able to handle. This range is often referred to as an influent quality "window". The window should reflect all reasonably-anticipated conditions, including seasonal variations and historically observed influent quality.

Risk for the efficacy and cost-effectiveness of the wastewater treatment process, while the influent quality is within the window, is transferred to the contractor. If the influent water quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the water is the sponsors' responsibility.

A comprehensive historical wastewater quality dataset is needed to set the influent quality window. For new land development, typical wastewater characterizations will have to be used. There may be a temptation to set the window wider for a P3 than a traditional project, and a small additional margin may be warranted to realize the "turnkey" benefits of the P3, but generally the influent quality window should not be significantly different for different delivery models.

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4.3 FACILITY SIZING

The quantity of influent expected to be handled by the treatment plant is not in the control of the contractor, and may be influenced by municipal activities under the sewer use bylaw and by water pricing (lower water use equals less sewage), and by extraneous flows. Therefore, it is generally necessary for the sponsor to specify the size (i.e. capacity) of wastewater treatment facilities. There is some risk in facility sizing, as there is potential to oversize and over-invest, or to under-build and require sooner than optimal expansion. The risk associated with sizing is deemed to be medium, and higher than that related to sizing water treatment facilities, because of the potential lack of understanding of flow rates and volumes of extraneous flows.

Included in facility sizing for a wastewater treatment plant is specification of bypass flows (i.e. in the event of weather events beyond the design level) that do not get treated. The risk associated with bypassing is retained to the extent that the reason is weather-related and not caused by the contractor's operation of the plant.

Plant capacity is one of two fundamental performance specifications for a wastewater treatment plant.

4.4 EFFLUENT QUALITY

The other fundamental performance specification for a wastewater treatment plant is the treated wastewater, or effluent, quality. The effluent quality will typically be dictated by a system-specific permit. The risk of meeting the effluent quality specification can be transferred to the contractor because it is given full control over the treatment process selection and accompanying plant design. The only caveat is that risk becomes shared if the influent quality deteriorates beyond the limits of the influent quality window.

In practice, proponents may not be given full and unfettered freedom to select the treatment process. For DBF, where the contractor has no long term obligation, a sponsor will typically either limit the allowable process technologies or have a process approval role to protect its interest in ensuring the long term viability of the process.[28] In a DBO, where there is a long term contractor obligation but the quality of the long term security is not the strongest, an sponsor may take similar measures or at least require that a process be proven elsewhere. In a DBFOM, the greatest freedom can be offered to proponents because the financing secures the long term risk transfer.

4.5 METHOD OF DISPOSAL

Almost universally, wastewater treatment plants are located adjacent to the ultimate site of disposal to the environment, and the method of disposal (to river, lake, groundwater, etc.) is dictated by geography. The emerging potential for effluent reuse creates the possibility that proponents may wish to sell effluent or treat it to a higher standard for economic gain. Allowing proponents to select disposal methods could therefore result in proposals from proponents with different risk profiles. Generally, the disposal method should be prescribed by the sponsor.

4.6 TREATMENT PROCESS EFFICIENCY

A wastewater treatment plant is essentially a big machine. Relative to more passive types of assets, operating costs can be high. Inputs include items such as treatment chemicals and electrical power. Transferring process efficiency risk to the contractor ensure that operating efficiency (a key element of overall lifecycle cost) is given due attention in proponents designs.

Because the contractor does not control the price of inputs or the quantity of influent, this risk is typically transferred by making the contractor responsible for any quantity of over-consumption, relative to a benchmark efficiency included in its bid. The benchmark efficiency would be used to calculate the net present value of the bid for purposes of awarding the contract, thus putting competitive tension on the bid efficiency of the plant. If, once operational, the plant uses more of an input per unit of treated wastewater than the bid indicated, the contractor would be required to cover that cost.

[28] The "progressive design build" delivery model identified earlier is even more consultative between the sponsor and contractor.

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4.7 ENVIRONMENTAL REGULATOR APPROVAL

In addition to the usual permits and approvals associated with a construction project, treatment plants typically require approval of the environmental regulator responsible for waste discharges to the environment before construction. These approvals are specific to the treatment plant designs and the risk must therefore be transferred to the contractor.

4.8 PERMIT COMPLIANCE

Depending on jurisdiction, permits/licences/certificates of approval (collectively, "permits") may be issued for wastewater systems overall and/or for specific wastewater treatment plants. The risk of compliance with permit conditions related to the operation of the treatment plant should be transferred, as the ability to comply is related to the design and operation of the plant, which are in the contractor's control.
In some jurisdictions, permits expire on a regular basis (e.g. in Nova Scotia, the Approval expires after ten years). The contractor should be transferred the responsibility for contributing to permit renewals for the infrastructure under contract, to the extent that such renewals are not a change in regulation (see below). Typically this contribution will be a documentation exercise.

4.9 REGULATORY CHANGE

Regulatory requirements for treatment plants are typically more significant than for networks because the treatment plant is the major determinant of the quality of the effluent discharged to the environment. Of primary concern is the addition of previously unregulated contaminants, or the lowering of allowable contaminant levels for currently regulated contaminants. In either of these cases, changes to regulations are known to the industry long in advance.

Broadly, since the risk of regulatory change is not within the control of the contractor, the risk must be retained. However, there are some sub-risks in this category that may be transferred as the cost impacts should be low and a qualified contractor should be able to mitigate the impacts. Again, an example is the risk of operator certification requirements changing. Another example are changes in permits that the regulator makes in response to the performance of the contractor, such as stepping up sampling and reporting requirements due to earlier noncompliance.

4.10 LATENT DEFECTS IN EXISTING INFRASTRUCTURE

If the P3 arrangement includes the assumption of responsibility for an existing plant, such as in an expansion or treatment process upgrade, the risk of defects in that infrastructure must generally be retained by the sponsor. Risk for elements of the treatment plant that can be readily inspected as part of the bidding process can likely be transferred, and a considerable portion of a wastewater treatment plant will fall into this category. However, there is often significant below-grade tankage that may be difficult or impossible to fully inspect. Overall, latent defect risk for an existing plant will at best be a shared risk.

4.11 GEOTECHNICAL RISK

Transfer of geotechnical risk for a wastewater treatment plant is desirable because the design of the plant may depend significantly on geotechnical conditions and there may be considerable scope for innovation in the handling of geotechnical conditions. Given that a treatment plant is confined within a well-defined site, the risk of widely varying conditions that cannot be detected through a site investigation program is low, compared to pipelines. And, allowing proponents access to do their own additional geotechnical investigation should they desire should be practical in most cases.

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5. Biosolids Processing Facilities

A biosolids treatment facility is analogous in many ways to a wastewater treatment plant with similar risks. Biosolids processing is sub-component of the overall wastewater treatment process, and processing facilities are almost always an integrated component of a wastewater treatment plant.

5.1 ALLOCATION OF KEY RISKS FOR BIOSOLIDS PROJECTS

RISK	TYPICAL ALLOCATION	RISK RATING
Sludge quality	Within window: transferred Outside window: retained	Medium
Interface	Shared	Medium
Facility sizing	Retained	Low
Biosolids quality	Transferred	Medium
Disposal method	Retained	Low
Process efficiency	Transferred	Medium
Regulatory change	Shared but primarily retained	Medium
Latent defects	Shared	Medium
Geotechnical	Transferred	Low

5.2 SLUDGE QUALITY

The input to a biosolids processing facility is the solids stream output of the wastewater treatment process, namely sludge. Sludge is not suitable for discharge to the environment or beneficial use without further processing to remove water and reduce pathogens - hence the need to process it into "biosolids". The quality of the sludge received by the biosolids processing facility is not under the control of the contractor. Water and pathogen content are dictated by the wastewater treatment process, which for this discussion is assumed to be the responsibility of others. Therefore, a sludge quality "window" for the incoming solids stream is needed for a biosolids plant.

Risk for the efficacy and cost-effectiveness of biosolids processing, while the sludge quality is within the window, is transferred to the contractor. If the sludge quality moves outside of the window (either temporarily or permanently), any incremental cost associated with treating the sludge is the sponsors' responsibility.

5.3 INTERFACE RISKS

A biosolids processing facility will typically return the water extracted from the sludge to the wastewater treatment plant. Managing what is accepted from the wastewater treatment plant, and returned to the wastewater treatment plant, creates an "interface risk". Overall optimization of the wastewater treatment + biosolids processing may require the cooperation and integration of the operators of each element of the wastewater treatment process. Interface risk is likely to be best managed by sharing the risk to encourage cooperation.

5.4 FACILITY SIZING

The quantity of sludge expected to be handled by biosolids processing facility is not in the control of the contractor and therefore, it would be necessary for the sponsor to specify the size (i.e. capacity) of a biosolids processing facility. The size would take into account population growth and anticipated changes to the wastewater treatment process that may increase sludge volumes. Processing facility capacity is one of two fundamental performance specifications for a biosolids processing facility.

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5.5 BIOSOLIDS QUALITY

The other fundamental performance specification for a biosolids processing facility is the quality of the biosolids residual (i.e. the treated sludge) created by the facility. The biosolids residual quality is likely to be dictated by regulation, depending on the intended disposal method (e.g. landfilling, incineration, land application, energy recovery, etc.). This risk is transferred subject to the sludge quality being within the specified window.

5.6 METHOD OF DISPOSAL

There are various means of disposing of biosolids residuals, such as landfilling, incineration, or land application. Generally, the responsibility (and risk) of selecting the disposal method should be retained by the sponsor. Otherwise, proposals from proponents could present significantly different risk profiles through differing exposures to regulatory change (which is also a retained risk).

5.7 TREATMENT PROCESS EFFICIENCY

Similar to water and wastewater treatment plants, the contractor should be held to a measure of operating efficiency for a biosolids processing facility that it designs and constructs.

5.8 ENVIRONMENTAL REGULATOR APPROVAL

Biosolids processing facilities may require approval of the environmental regulator responsible for waste discharges to the environment before construction. These approvals may be specific to the facility design, and if so must therefore be transferred to the contractor.

5.9 REGULATORY COMPLIANCE

Depending on jurisdiction, permits/licences/certificates of approval (collectively, "permits") may be issued for wastewater systems overall and/or for specific wastewater treatment plants including biosolids processing. The risk of compliance with permit conditions related to the operation of the biosolids processing facility should be transferred, as the ability to comply is related to the design and operation of the plant, which are in the contractor's control.

5.10 REGULATORY CHANGE

Provincial / territorial regulations cover varying aspects of biosolids production, transportation, storage, handling, land application, landfilling and incineration.[29] Disposal of residuals is perhaps more complex than water and wastewater treatment, because disposal is often off-site, dispersed, or the residual is a raw material for products such as compost or fertilizer. Permits and approvals may be needed not only for the facility itself, but the decoupled disposal methods,[30] of which there could be more than one.

Since regulatory change is outside the control of the contractor, it must generally be retained. If, however, the selection of disposal method is made a contractor responsibility, then the risk associated with regulatory change in disposal requirement should be transferred as well.

As with the other project types, there are some sub-risks such as operating training requirements and meeting change in permits that the regulator makes in response to the performance of the contractor, that may be transferred.

5.11 LATENT DEFECTS IN EXISTING INFRASTRUCTURE

The discussion of latent defect risks in water and wastewater treatment plants applies to biosolids processing facilities as well.

[29] Opus DaytonKnight, *Water, Wastewater and Biosolids Study*, June 2011, prepared for PPP Canada

[30] This is well illustrated by Table 3 in the document *Review of the Current Canadian Legislative Framework for Wastewater Biosolids*, Canadian Council of Ministers of the Environment, 2010

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5.12 GEOTECHNICAL RISK

The discussion of geotechnical risk in water and wastewater treatment plants applies to biosolids processing facilities as well.

6. Beneficial Residual Reuse and Market Risks

The residuals of wastewater and biosolids treatment projects may in some cases be beneficially reused, for example:

- treated effluent may be used for irrigation, industrial process water, or toilet flushing (i.e. "purple pipe");
- beneficial nutrients may be recovered from wastewater effluent during treatment;
- methane gas from sludge digestion is often used to fuel plant equipment, but there may be excess gas that can be used as vehicle fuel or sold into the natural gas distribution system; and
- biosolids residuals may be inputs to fertilizer products or applied directly to agricultural land.

The revenue opportunities may currently be limited, but there is the potential as time goes on for the demand for, and value of these residuals to increase, for example in locales where water is scarce.
For projects with such revenue potential, the revenue risk may be retained, shared, or fully transferred. The most appropriate approach will depend on the relative size of the revenue opportunity, the certainty of the revenue, the additional investment necessary to capture the opportunity, and which party has the skills and market power to best exploit the opportunity.

We expect most revenue opportunities to be relatively modest, and incremental to a base project description. In the event that revenue opportunities dominate a project, there may be a purely commercial opportunity that does not necessitate municipal involvement or a P3 arrangement – one can conceive of a situation (in the future) where untreated wastewater and/or sludge can simply by sold as a resource by a municipality without any municipally-funded treatment.

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APPENDIX B

Glossary of Key Terms

TERM	DEFINITION
Availability Payment	A periodic payment by the Procuring Authority to the Project Company to cover the project's capital, operational and maintenance costs. The availability payment can be reduced for non-performance (availability, service and quality failures); or increased for exceeding performance standards, in keeping with the terms of the P3 Project Agreement.
Biosolids	Solid or semisolid material obtained from treated wastewater.
Bolt-on Approach	A strategy that takes an existing system and adds a separate component with no or minimal interface complexity.
Brownfield	In this report, refers to projects that are improvements or expansions of existing infrastructure, in contrast to brand-new "greenfield" projects.
Design-Bid-Build (DBB)	A project delivery model in which the public sector contracts with separate entities for each of the design and construction of a project. DBB is the traditional method for project delivery.
Design-Build-Finance (DBF)	A delivery model in which the private sector is generally responsible for the design, construction and financing of a project during the construction period. The project is paid for by the public sector at the completion of construction.
Design-Build-Finance- Maintain (DBFM)	Typically considered for large projects involving new construction on a vacant site (greenfield or brownfield). The private sector is generally responsible for design, construction, long-term financing and maintenance. The project is paid for through a combination of substantial completion and availability payments over a fixed period, usually 25 to 30 years.
Design-Build-Finance- Operate-Maintain (DBFOM)	Typically considered for large projects involving new construction on a vacant site (greenfield or brownfield). The private sector is generally responsible for design, construction, long-term financing, operations and maintenance. The project is paid for through a combination of substantial completion and annual service payments over a fixed period, usually 25 to 30 years.
Design-Build-Operate-Maintain (DBOM)	Typically considered for smaller projects involving new construction on a vacant site (greenfield or brownfield). The private sector is generally responsible for design, construction, operations and maintenance. Risk transfer is not anchored by private financing.
Feasibility Study	A feasibility study is an analysis and evaluation of a proposed investment to determine whether and how it can be successfully carried out. The feasibility study often includes the following elements such as: a) establishing the need for the investment; b) confirming it is technically feasible; and c) an assessment of the anticipated capital and operating costs. Typically the feasibility study includes historical background, marketing research, and financial data as well as an examination of the investment's alignment with governmental priorities and policies.
Finance /Financing	Private financing can take two forms: A) the private sector partner arranges the construction financing until substantial completion. During construction, the public sector partner can make milestone payments or a lump sum payment at substantial completion. B) in order to transfer additional financial risk to the partner, a long term private financing approach is used. Under this scenario, the private sector provides a percentage of financing during the construction phase that could be carried over through the end of the concession period. Securing private financing during the concession period anchors the risks transferred during the operational period.
Greenfield	A project that lacks constraints imposed by prior work, with no need to remodel or demolish an existing structure.
Innovation	In P3 projects, innovation is an element brought into the project by the private sector, which was not originally conceived by the public sector and provides either tangible or intangible value. Innovation can take the form of new technologies, more efficient designs, construction methods, operations methods, aesthetic appeal, etc. Innovation is evaluated retrospectively and does not appear on initial analysis or VfM because it typically is not anticipated. However, an RFP should include a method for assessing innovations in the event they are included in the bidders' proposals.

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Letter of Credit	A letter from a bank guaranteeing that a buyer's payment to a seller will be received on time and for the correct amount. In the event that the buyer is unable to make payment on the purchase, the bank will be required to cover the full or remaining amount of the purchase.
Lifecycle Costs	The whole life cost of delivering an infrastructure asset including design, construction, operational, maintenance, recurring or one time major maintenance costs and residual value at the end of ownership or useful life. Major maintenance costs are defined as the cost of major renovation or replacement of major components of an infrastructure asset and are included as part of lifecycle costs.
Market Sounding	A process by which the public sector gathers intelligence from potential bidders and other market players regarding various aspects of the investment. The process is used to test/confirm assumptions, identify areas of concern for the private sector, and assess the market's potential level of interest in the investment. The market sounding also informs the market of the potential investment and provides market players with an overview of the investment, including the potential procurement process and the commercial structure. Typically the market sounding document includes a project profile, a potential procurement process and the high level commercial structure.
Output Specifications	Performance-based specifications and requirements that articulate the public sector's performance expectations of the private sector and form the basis upon which bidders develop their proposals. Reliance on performance based measures leaves bidders with the responsibility for determining how to best meet the requirements, thus allowing for innovative and creative approaches. Output specifications are set out by the asset owner.
Procurement Strategy	An element of the process that outlines the public sector's approach to the procurement process, including: staging (RFQ, RFP, etc.); information release; bidder engagement; bidder compensation; governance; implementation plan, bid response; applicant-bidder interaction; and evaluation procedure. The Strategy will be informed by the public sector's policies and guidelines with regards to procurement.
Procuring Authority	The entity designated and authorized to procure the project.
Project Agreement	The contract governing the relationship between the Procuring Authority and the Project Company/Consortium/SPV/Concessionaire /Private Partner. The project agreement clearly outlines the risk sharing mechanism, including the roles and responsibilities of both the public and the private parties. The project agreement contains key schedules that outline contractual obligations such as: design and schedule, output specifications, payment mechanism/ penalties for non-performance, performance security requirements, lender's direct agreement, commissioning and testing, hand back requirements, dispute resolution and termination payments.
Project Company/ Consortium/SPV/ P3 Partner	In the context of a P3, these terms are used to refer to the commercial entity established to fulfill the private sector's obligations under the Project Agreement. This entity, which could take many forms, including that of a corporation or a partnership, will have no pre-existing assets or liabilities and will typically be owned by equity providers of the winning consortium. Lenders, designers, constructors and operational and maintenance contractors are all contractually related to this entity.
Project Finance	The financing of long-term infrastructure, industrial projects and public services based upon a non-recourse or limited recourse financial structure where project debt and equity used to finance the project are paid back from the cash flow generated by the project. It is a common form of financing in P3s because it allows for the formation of project consortia consisting of companies with various financial capacities. The nature of this financial structure requires thorough due diligence and comprehensive risk analysis and risk allocation which limits risk for all parties involved and allows for high leverage.
Proponent	A bidder in a procurement process.
Public Private Partnership (P3)	A long-term contractual relationship between a public authority and the private sector that involves: the provision of capital assets and associated services to meet a defined output specification (i.e., define what is required rather than how it is to be done); the integration of multiple project phases (e.g., design, build, finance, operate and maintain); the transfer of risk to the private sector anchored with private sector capital at risk; and the performance-based payment mechanism.
P3 Business Case	The P3 business case will identify and assess a range of procurement models using both qualitative and quantitative analysis. The intent of a P3 business case is to identify, assess and make a recommendation on the appropriate procurement model that best achieves project objects and Value for Money for taxpayers. The business case will start with a project rationale and then proceed to a plan for the execution of the project, including strategic alignment, transaction structure, procurement process, and project governance.

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Qualitative Assessment	A qualitative assessment considers non-financial factors such as degree of confidence in good whole-of-life performance, social benefits, aesthetic design, functionality, and political risk. Consideration must also be given to organizational and operational impacts and whether the project is suitable for private sector management.
Quantitative Assessment	A quantitative assessment considers financial factors such as size and timing of cash flows, payments through the lifecycle, project risks and the Value for Money for each model.
Rehabilitation	Any major maintenance work that would be classified as a capital expenditure, including replacement or rebuilding of asset components. Such work is typically non-routine and intermittent.
Request for Expression of Interest (RFEOI)	A formal step in the procurement process by which potential bidders are requested to submit non-binding documentation stating their intention to bid on a project along with proposed ideas and concerns in a commercially confidential way.
Request for Proposal (RFP)	The RFP process is the final stage of a P3 procurement and occurs after the RFQ process. The RFP process results in the selection of the preferred proponent who will enter into a project agreement with the public sector. The RFP document clearly describes the public sector's requirements, the procurement process, the evaluation criteria and methodology, and security requirements (e.g., letters of credit, surety, etc.). The RFP for a P3 will include the project agreement and key schedules, including the output specifications, payment mechanism and hand back requirements.
Request for Qualification (RFQ)	The RFQ process in a P3 procurement is meant to produce a short-list of qualified bidders for the RFP process through an assessment of interested parties' experience and qualifications as they relate to the project being procured (e.g. project management experience, infrastructure design and construction experience, etc). The RFQ document articulates clear criteria against which bidders are evaluated and pre-qualified. The RFQ may limit bidder participation to a few pre-qualified participants which increases a potential bidder's motivation to participate in the procurement process because it increases a bidder's chance of winning. A typical RFQ in the Canadian P3 market short lists the three most qualified bidders. The RFQ process also optimizes the procuring authority's resource allocation in the RFP process as more than three bidders necessitate additional effort for a fair, open and transparent evaluation, and less than three bidders may result in an erosion of competitive tension during the procurement process.
Retained Risk	Risks that are not transferred to, or shared with, the private sector partner but lie solely with the Procuring Authority. These tend to be risks where there the private sector is unwilling to accept the risk or can be expected to charge significant premiums for doing so. As such, they are most efficiently managed by the public sector. An example of a risk typically retained by a Procuring Authority is the "risk of a change in law."
Revenue (Project Revenue)	In the context of P3s, there are generally two types of revenue: external project revenues where the private sector is allowed to charge user fees (e.g. toll road concession); and availability based revenues where there are availability-based payment by the Procuring Authority. Expected project revenues are an important consideration for project viability as they must be sufficient to cover all project costs (capital, operational and lifecycle maintenance) as well as generate acceptable returns for investors.
Revenue Risk	In the context of P3s, revenue risk refers to the third party risk associated with demand or production output of an asset and its impact on revenues. If revenue risk is transferred to the private sector and the asset does not generate revenue or generates less revenue than expected in a given time, the private sector is contractually responsible and will be responsible to absorb or mitigate revenue shortfalls.
Risk Transfer	Risk exists in all projects, irrespective of the procurement approach. In a P3, risks are allocated to the party that can best manage them, thereby reducing financial uncertainty for the public sector.
Risk Workshop	An event in which the project team and relevant specialists are asked to identify, quantify (impact and probability) and allocate risks that could affect the various stages of a project (planning, construction, operations, lifecycle).
Substantial Completion	A level or state of completion defined in the Project Agreement that is generally characterized by completion of the construction of the asset including all equipment installations, the issuance of any applicable occupancy permits; and the assets readiness to commence operating.
Substantial Completion Payment/Bullet Payment	A one-time payment by the Procuring Authority to the Project Company at the time of substantial completion of a project's construction. A substantial completion payment reduces a project's long term private financing requirement and associated private financing costs. Substantial completion payments will generally be set as percentage of the project's construction costs, and must be incorporated into a P3 project's financial structure with consideration for long-term risk transfer and liquidity.

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Traditional Procurement	The status quo approach to procurement for the Procuring Authority. While different authorities may have different default approaches, the most common approach to procurement is the Design-Bid-Build approach. In this method, the Procuring Authority enters into separate, sequential contracts: one for the design and specification of the asset; and another for its construction. As such, the Procuring Authority retains the majority of the risks associated with the project, such as design flaws, cost over-runs, and delays in construction. During operations, the performance of the asset is the responsibility of the Procuring Authority or any third party operator hired to carry out operations.
Twinning	The construction of similar or identical assets.
Value for Money (VfM)	Value for Money (VfM) is the comparison between the total project costs (capital base costs, financing costs, retained risks and ancillary costs), at the same point in time, for a traditionally procured project (known as the public sector comparator or PSC) and delivery of the same project using the P3 model (known as the shadow bid). The incremental difference between the public sector comparator and the shadow bid is referred to as the VfM. There is said to be positive VfM by procuring a project using a P3 approach when the Shadow Bid is less than the public sector comparator.
Wastewater	Refuse water from residential, commercial, and industrial facilities. Generally assumed to be in need of treatment before being released into the environment.
Water / Wastewater Sector	Broadly encompasses all municipal drinking water and wastewater management projects and infrastructure, including biosolids.

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APPENDIX C
Glossary of Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
ASAP II	Alberta Schools Alternative Procurement II
DBF	Design-Build-Finance
DBFM	Design-Build-Finance-Maintain
DBFOM	Design-Build-Finance-Operate-Maintain
DBO	Design-Build-Operate
DBOM	Design-Build-Operate-Maintain
LC	Letter of Credit
O & M	Operate and Maintain
PPP	Public-Private Partnership
RFEI	Request for Expression of Interest
RFP	Request for Proposal
RFQ	Request for Qualification
SPV	Special Purpose Vehicle
VfM	Value for Money

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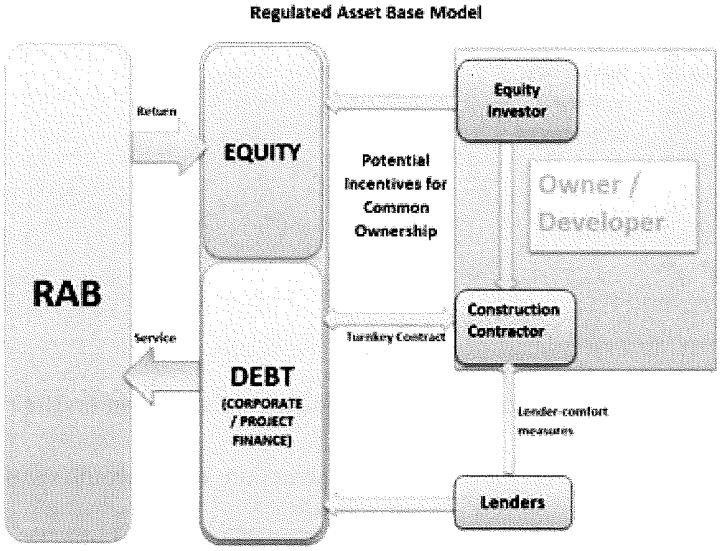
Mitchell2, Lisa (INFC)

From: Jiang, Yi (INFC)
Sent: June 10, 2019 5:11 PM
To: Mitchell2, Lisa (INFC); Kokhanova, Milla (INFC); Suffel, Jordan (INFC)
Cc: Bowlby, Mark (INFC); Nabi, Amena (INFC)
Subject: RE: Mapleton Follow Up

Lisa,

See below our analysis:

Below is a diagram demonstrating the regulated asset base (RAB) model:

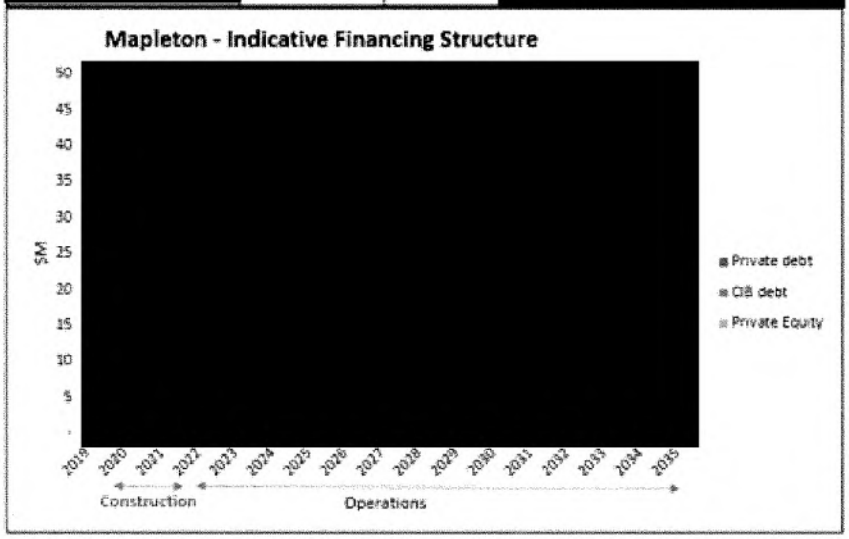


- Based on research of market deals, the debt/equity ratio in a typical RAB model is normally ranging from 60/40 to 70/30 to account for the excessive risks, as such Mapleton proposal is aligned with market

Below is a demonstration of CIB's proposed financing structure assuming the project is successfully built and well managed throughout (i.e. cash flows will be generated as anticipated and a portion will be used to finance the asset growth)

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Regulated Asset Base (RAB) Model	Amount ($M)	% of Capital Cost (%)	Comments
CIB Debt	20	60	Issued on 1/1/2020 (Construction Begin for a duration of 2 years)
Private Equity	13.33	40	Issued on 1/1/2020 (Construction Begin for a duration of 2 years)
Annual RAB Growth	[redacted]	-	Starting on 1/1/2022 (Operations Begin) Financed 60/40 debt/equity
Private Debt - [redacted]	20	-	[redacted]



Considerations

- Five proponents bid for the Mapleton project, indicating potential capacity for financing the project on their own (corporate finance)
- CIB as the only lender has to assume all due diligence responsibilities during construction, which would require strong technical expertise in place
- [redacted]

Thanks to Milla for her guidance and help in utility modelling!

Yi

From: Mitchell2, Lisa (INFC)
Sent: Monday, June 10, 2019 10:10 AM
To: Kokhanova, Milla (INFC) <milla.kokhanova@canada.ca>; Jiang, Yi (INFC) <yi.jiang@canada.ca>; Suffel, Jordan (INFC) <jordan.suffel@canada.ca>
Cc: Bowlby, Mark (INFC) <mark.bowlby@canada.ca>; Nabi, Amena (INFC) <amena.nabi@canada.ca>
Subject: FW: Mapleton Follow Up

Team,

I am drafting a response and a 1-pager on the below – Yi – can we visually map out what the financing would look like? What they propose below is equity being injected from the beginning rather than at or just before SC, how would this look?

Thanks,

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ATIA - 18(b) | ATIA - 21(1)(b)
ATIA - 21(1)(a) | ATIA-24(1)

-L

From: Lindsay Caldwell [mailto:lcaldwell@cib-bic.ca]
Sent: June 3, 2019 2:31 PM
To: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Kokhanova, Milla (INFC) <milla.kokhanova@canada.ca>
Cc: Sashen Guneratna <sguneratna@cib-bic.ca>; Pranav Shah <pshah@cib-bic.ca>; Jeffrey To <jto@cib-bic.ca>; Kunwar Singh <ksingh@cib-bic.ca>; Olivia Nguyen <onguyen@cib-bic.ca>; Suffel, Jordan (INFC) <jordan.suffel@canada.ca>; Jiang, Yi (INFC) <yi.jiang@canada.ca>; Khan, Irmeen (INFC) <irmeen.khan@canada.ca>; Bowlby, Mark (INFC) <mark.bowlby@canada.ca>
Subject: RE: Mapleton Follow Up

Hi Lisa,

I hope you had a great weekend. Thank you for your email last week. It was very helpful to hear your perspective on the project [redacted] We have spent some time considering these comments and hope we can provide further comfort on the project based on our responses below.

[redacted]

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Please let us know if you have any further questions.

Best,

Lindsay

From: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Sent: May 30, 2019 3:40 PM
To: Lindsay Caldwell <lcaldwell@cib-bic.ca>; Kokhanova, Milla (INFC) <milla.kokhanova@canada.ca>
Cc: Sashen Guneratna <sguneratna@cib-bic.ca>; Pranav Shah <pshah@cib-bic.ca>; Jeffrey To <jto@cib-bic.ca>; Kunwar Singh <ksingh@cib-bic.ca>; Olivia Nguyen <onguyen@cib-bic.ca>; Suffel, Jordan (INFC) <jordan.suffel@canada.ca>; Jiang, Yi (INFC) <yi.jiang@canada.ca>; Khan, Irmeen (INFC) <irmeen.khan@canada.ca>; Bowlby, Mark (INFC) <mark.bowlby@canada.ca>
Subject: RE: Mapleton Follow Up

Lindsay/Sashen,

Thank you very much for the follow up. The team and I very much appreciated you taking the time to walk us through in more detail, what the Mapleton deal looks like. Our notes from the meeting are below.

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[redacted]

Thanks, and again, we appreciate you taking the time. [redacted]

Additionally, if you have any changes to our meeting notes below, please let us know.

Thanks,
-Lisa

Meeting Notes – Monday, May 27, 2019

[redacted]

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[redacted]

Lisa Mitchell

Senior Director, Investment, Partnerships and Innovation
Infrastructure Canada / Government of Canada
lisa.mitchell2@canada.ca / Tel: 613-948-6111

Directrice principale, Investissement, parteneriats et innovation
Infrastructure Canada / Gouvernement du Canada
lisa.mitchell2@canada.ca / Tél. : 613-948-6111

From: Lindsay Caldwell [mailto:lcaldwell@cib-bic.ca]
Sent: May 28, 2019 10:45 AM
To: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Kokhanova, Milla (INFC) <milla.kokhanova@canada.ca>
Cc: Sashen Guneratna <sguneratna@cib-bic.ca>; Pranav Shah <pshah@cib-bic.ca>; Jeffrey To <jto@cib-bic.ca>; Kunwar Singh <ksingh@cib-bic.ca>; Olivia Nguyen <onguyen@cib-bic.ca>
Subject: Mapleton Follow Up

Hi Lisa,

As discussed on our call yesterday, please find attached the back of the envelope calculations we have done to estimate the potential benefits of a CIB loan to the Mapleton project.

Please let us know if you have any questions.

Best,

Lindsay

Lindsay Caldwell, [redacted]
Director, Investments | directrice, Investissement
Office: 416 847-7727
Cell: [redacted]
Email: lcaldwell@cib-bic.ca

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CANADA INFRASTRUCTURE BANK | BANQUE DE L'INFRASTRUCTURE DU CANADA
150 King Street West, Suite 2309, P.O. Box 15, Toronto, ON, M5H 1J9
www.cib-bic.ca

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Mitchell2, Lisa (INFC)

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 3:49 PM
To: Seto, Lina (INFC)
Cc: Mitchell2, Lisa (INFC)
Subject: RE: FOR REVIEW - Mapleton

The CIB informed me that their products have not changed but they will keep our advice in mind for post-announcement messaging and media interviews.

They have provided me with the following answers (verbally) in response to PCO's questions:

I am unclear as to how this small investment squares with the CIB's mandate and its previous position regarding minimum project threshold.

The project is a pilot- a new model demonstrating how the CIB can partner with municipalities across Canada to attract private sector capital to improve financing related to upgrading aging water and wastewater systems.

While the CIB has only invested in bigger projects so far, there is no target or threshold for project sizes in its mandate.

Has the CIB been engaging with other orders of government on the possibility of funding small projects in various jurisdictions?

CIB has been actively engaged with all PTs to listen to their priorities. There is ongoing interest from many jurisdictions in projects of different sizes.

Do we have the structure of the deal? How much private money does the bank investment raise from private sector?

This is a competitive bidding process. The town is just entering RFP stage and we are not in a position to predict structure or how capital amounts .

From: Seto, Lina (INFC)
Sent: July 12, 2019 3:28 PM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

OK thanks!

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 3:14 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Thank you. I haven't been able to get ahold of anyone on David's team yet. They have been in meetings.

From: Seto, Lina (INFC)
Sent: July 12, 2019 3:11 PM

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To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

These are the edits (with Glenn's OK) to address the point about this being a small project.

Do we have an indication of whether the CIB has revised their products to address this point (and comments below)?

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 2:17 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Please go ahead and draft. I will work with CIB to answer the rest of the questions. Thank you.

From: Seto, Lina (INFC)
Sent: July 12, 2019 2:16 PM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Do you want us to write it and pass through Glenn or will comms draft?

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 2:10 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Sure, we can propose to mino some clarification to the statement. Thank you.

From: Seto, Lina (INFC)
Sent: July 12, 2019 2:09 PM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Can we take this opportunity to revise the text to clarify?

Also, regarding the other questions, might be best for the CIB to respond. These are also the questions that we raised for the CIB to respond to in their Q&A.

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 1:59 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

The current line in our statement covers the first-of-its kind messaging, but does not explain why...

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"This investment is the Bank's first initiative in a smaller project, and is a fine example of how the Bank is making public dollars go further by structuring infrastructure investments to attract private capital in projects large and small."

From: Seto, Lina (INFC)
Sent: July 12, 2019 1:56 PM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

This is why we wanted to adjust the Ministers statement to say that it is a pilot for the CIB. They are tasked with large transformative but Mapleton is small and a pilot/first of its kind for CIB

Checking with project colleagues on the other questions below

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 1:54 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

And one more question from PCO that I am hoping for your help with:

Hi Fatima, another comment: At the 2018 FPT Ministers of Infrastructure meeting, the CIB's CEO presented to ministers, who asked what the minimum threshold would be for investment. At the time, Mr. Lavallée indicated that the CIB would only invest in large and very large projects, suggesting that the minimum threshold would be $1 billion. **I am unclear as to how this small investment squares with the CIB's mandate and its previous position regarding minimum project threshold**. Has the CIB been engaging with other orders of government on the possibility of funding small projects in various jurisdictions?

From: Seto, Lina (INFC)
Sent: July 12, 2019 1:50 PM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Can you send me the version of the statement they are reviewing?

From: Baalbaki2, Fatima (INFC)
Sent: July 12, 2019 1:46 PM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Cc: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi Lina,

PCO is reviewing our statement and wants us to add a clarification:

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Do we have the structure of the deal? How much private money does the bank investment raise from private sector ? Can we make it more clear that it is because of the infra bank that we have more money from the private sector without reducing the province envelop in the infra plan.

Is this something you can help me put together this afternoon? Or should I go to the CIB for clarification?

Fatima

From: Seto, Lina (INFC)
Sent: July 11, 2019 10:53 AM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi Fatima,

We do have some comments. [redacted]

Lina

From: Baalbaki2, Fatima (INFC)
Sent: July 11, 2019 10:40 AM
To: Seto, Lina (INFC) <lina.seto@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi Lina,

Do you expect to have further comments on the products? CIB needs our feedback by noon today. Thanks!

Fatima

From: Seto, Lina (INFC)
Sent: July 11, 2019 9:48 AM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi Fatima,

Is there a new set of products or are we still working off the July 3 documents?

Thanks,
Lina

From: Baalbaki2, Fatima (INFC)
Sent: July 11, 2019 9:43 AM
To: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Seto, Lina (INFC) <lina.seto@canada.ca>

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Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>
Subject: RE: FOR REVIEW - Mapleton

Just us here. I have no further comments on these- some of our previous feedback was incorporated. but not all. Mino has not provided me with any comments either.

You guys?

From: Félix Corriveau [mailto:fcorriveau@cib-bic.ca]
Sent: July 11, 2019 9:32 AM
To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>; David Morley <dmorley@cib-bic.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: RE: FOR REVIEW - Mapleton

Bonjour

I hope your having a good day.

I was wondering if you have any comments on the products we sent you on Mapleton. We would need your input by noon today. The town is passing the motion tonight and we need our products to be ready.

Regards

Félix Corriveau
Senior Director, Corporate Communications and Media Relations | Directeur principal, communications d'entreprises et relations médias

T : +1-416-847-7741
C [redacted]

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From: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>
Sent: 10 juillet 2019 09:08

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To: Félix Corriveau <fcorriveau@cib-bic.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>; David Morley <dmorley@cib-bic.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: RE: FOR REVIEW - Mapleton

Merci Felix! We will let you know if we have any feedback on these.

From: Félix Corriveau [mailto:fcorriveau@cib-bic.ca]
Sent: July 9, 2019 7:07 PM
To: Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>; David Morley <dmorley@cib-bic.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi all

I hope this message finds you well.

Attached are our news release and our QA's.

We are looking forward to having your comments on these documents.

Regards

Félix Corriveau
Senior Director, Corporate Communications and Media Relations | Directeur principal, communications d'entreprises et relations médias

T : +1-416-847-7741
C [redacted]

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From: Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>
Sent: 9 juillet 2019 15:35
To: David Morley <dmorley@cib-bic.ca>; Félix Corriveau <fcorriveau@cib-bic.ca>

Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: RE: FOR REVIEW - Mapleton

Hi David and Felix, just checking in on this – are you able to share? Thanks!

From: Hobbs, Joshua (INFC)
Sent: July 9, 2019 9:13 AM
To: 'David Morley' <dmorley@cib-bic.ca>; Félix Corriveau <fcorriveau@cib-bic.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: RE: FOR REVIEW - Mapleton

Good morning David and Felix,

Hoping that you can share the final NR and Q&A this morning. As well, if there's any other background material you have on the project, that would be greatly appreciated.

Thanks,
Josh

From: David Morley [mailto:dmorley@cib-bic.ca]
Sent: July 8, 2019 9:22 AM
To: Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>; Félix Corriveau <fcorriveau@cib-bic.ca>
Cc: Childs, Emma (INFC) <emma.childs@canada.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Terence Foran <tforan@cib-bic.ca>
Subject: Re: FOR REVIEW - Mapleton

Morning all,

Yes, we'll get you a new draft of the products by tomorrow morning. We are doing a few minor touch ups, including developing a quote for the Minister. Felix will lead [redacted]

The town has decided to delay its council meeting until Thursday and we will be adjusting the news release timing accordingly. The target date will likely shift to Monday 15th, to be confirmed.

David

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From: Hobbs, Joshua (INFC)

Sent: July 8, 2019 9:03 AM

To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>; Terence Foran <tforan@cib-bic.ca>

Cc: David Morley <dmorley@cib-bic.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Tam2, Pauline (INFC) <pauline.tam2@canada.ca>; Childs, Emma (INFC) <emma.childs@canada.ca>

Subject: RE: FOR REVIEW - Mapleton

Good morning Terence,

Can you please share with me this morning the final Q&A document, as well as the news release?

Thanks!

Josh

From: Baalbaki2, Fatima (INFC)

Sent: July 5, 2019 1:02 PM

To: Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>; Terence Foran <tforan@cib-bic.ca>

Cc: David Morley <dmorley@cib-bic.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Tam2, Pauline (INFC) <pauline.tam2@canada.ca>

Subject: RE: FOR REVIEW - Mapleton

Hi Terence,

Do you have updated products for Mapleton announcement? Can you please confirm that the release date is still July 9th?

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Fatima

From: Hobbs, Joshua (INFC)

Sent: July 3, 2019 8:42 AM

To: Terence Foran <tforan@cib-bic.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>

Cc: David Morley <dmorley@cib-bic.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Tam2, Pauline (INFC) <pauline.tam2@canada.ca>

Subject: RE: FOR REVIEW - Mapleton

Hi Terence,

Attached is our feedback on the products for the Mapleton announcement. Can you please share with us the final versions once ready?

Thanks!

Joshua Hobbs

Senior Communications Advisor, Communications Directorate, Ministerial and Advisory Services

Infrastructure Canada / Government of Canada

joshua.hobbs@canada.ca/ Tel: 613-960-6869 / Cel: 613-404-1392

Conseiller principal en communications, Direction des Communications, Services ministériels et consultatifs

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ATIA - 21(1)(b)

joshua.hobbs@canada.ca / Tél. : 613-960-6869 / Tél cell. : 613-404-1392

From: Terence Foran [mailto:tforan@cib-bic.ca]

Sent: June 27, 2019 11:38 AM

To: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>

Cc: David Morley <dmorley@cib-bic.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>

Subject: RE: FOR REVIEW - Mapleton

Hi Fatima – Yes, ideally our date of release is when the RFP is issued to proponents but there is flexibility, especially if there is an event or media opportunity.

Thanks, Terence

From: Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>

Sent: Thursday, June 27, 2019 11:30 AM

To: Terence Foran <tforan@cib-bic.ca>

Cc: David Morley <dmorley@cib-bic.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Hobbs, Joshua (INFC) <joshua.hobbs@canada.ca>

Subject: RE: FOR REVIEW - Mapleton

Thanks Terence, we will take a look. Would the date of your release be the same day as RFP issuance, [redacted]

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ATIA - 21(1)(b)

From: Terence Foran [mailto:tforan@cib-bic.ca]

Sent: June 27, 2019 11:20 AM

To: Mitchell2, Lisa (INFC) <lisa.mitchell2@canada.ca>; Marchildon, Caroline (INFC) <caroline.marchildon@canada.ca>; Baalbaki2, Fatima (INFC) <fatima.baalbaki2@canada.ca>

Cc: David Morley <dmorley@cib-bic.ca>

Subject: FOR REVIEW - Mapleton

Hi there,

Please see attached news release and QAs around CIB's Mapleton investment and further updates:

[redacted]

Any comments are appreciated by Wednesday July 3. If there are any questions, please feel free to call. These products are concurrently circulating with the Township.

Thank you,

Terence D. Foran

Senior Manager, Corporate Communications| Cestionnaire principal, communications d'entreprise

Office: 416-847-7743

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Email: tforan@cib-bic.ca

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Mapleton TOWNSHIP Rooted in tradition. Growing for the future.

CANADA INFRASTRUCTURE BANK ANNOUNCES UP TO $20 MILLION INVESTMENT COMMITMENT IN MAPLETON WATER AND WASTEWATER PROJECT

Innovative financing partnership for new public municipal infrastructure

Disponible en français

July xx, 2019

TORONTO – Canada Infrastructure Bank (CIB) announced today an investment commitment of up to $20 million in the Township of Mapleton's water and wastewater project. The Township is seeking a consortium to design, build, finance, operate and maintain the municipality's new and existing water and wastewater infrastructure for up to 20 years. Mapleton will continue to own all existing and new infrastructure assets.

This partnership demonstrates how the CIB can enable the public and private sectors to improve infrastructure delivery in Canada and help the Township of Mapleton continue to provide households and businesses access to clean drinking water using modern infrastructure.

As part of the project, the Township will upgrade its water system including the building of a new water tower, upgrading an existing water pumping station, a wastewater treatment project, and a gravity sanitary collection system.

The Township of Mapleton is leading the competitive procurement process including selecting the preferred proponent. Mapleton will focus on its core role as asset owner and water utility regulator and will hold the selected proponent accountable to deliver the water and wastewater infrastructure.

Mapleton's innovative approach can be considered a pilot project to demonstrate new models for structuring and financing smaller municipal water and wastewater infrastructure projects.

The CIB's investment commitment will improve the cost of project financing and attract private capital expertise while ensuring appropriate risk transfer to the private sector. This is an example of how CIB's innovative financing model can be a catalyst for new infrastructure in both small and large communities.

The investment will be offered in the form of a standardized debt financing package to all proponents during the request for proposals open period. CIB will finalize a credit agreement with the project's Preferred Proponent at Financial Close.

Quick Facts:

- The Township of Mapleton is located in the southern Ontario County of Wellington. The Township is an agricultural and rural community of approximately 11,000 residents.
- The project will expand access to safe drinking water and capacity for the treatment of wastewater for up to 20 years.

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- The project is a new model demonstrating how the CIB can partner with municipalities of all sizes across Canada to attract private sector capital to improve financing related to upgrading aging water and wastewater systems.
- CIB is focused on transformational projects that are in the public interest. Public transit, trade and transportation, green infrastructure and broadband are its priority sectors for investment.
- As a crown corporation, CIB uses federal funding to attract private sector and institutional investment to new revenue-generating, infrastructure projects in the public interest. CIB's partnership investments are helping infrastructure projects across Canada move forward.

Quotes:

Mapleton Council is exploring new funding and partnership models to benefit our community over the long term. The approach we are using will ensure Mapleton's water needs will be met safely, efficiently and affordably. We are proceeding with a competitive procurement process and are very pleased to have the Canada Infrastructure Bank involved to provide an innovative financing option. We hope that our approach to improve our infrastructure will create best practices for other municipalities to modernize their water and wastewater systems.

Gregg Davidson, Mayor, Township of Mapleton

This is an exciting partnership between the Township of Mapleton and Canada Infrastructure Bank. CIB is a new model of federal support for projects including green infrastructure. Our innovative financing approach will help Mapleton invest in new, expanded and sustainable public water and wastewater facilities.

Pierre Lavallée, President and CEO, Canada Infrastructure Bank

The Government of Canada created the CIB to play a leading role in new infrastructure projects that will benefit communities. The financing support and infrastructure expertise provided by the CIB to the Township of Mapleton's project will ensure long-term access to sustainable public water and wastewater facilities. This is an opportunity to create a new model that could improve publicly-owned water and wastewater systems, including in smaller communities across Canada.

The Honourable François-Philippe Champagne, Minister of Infrastructure and Communities

Learn More:

Canada Infrastructure Bank

Township of Mapleton

Contacts:

Felix Corriveau
Canada Infrastructure Bank
fcorriveau@cib-bic.ca
416-550-0900

Disponible en français

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Township of Mapleton
Funding Announcement QAs
July xx, 2019

Key Messages:

- Canada Infrastructure Bank (CIB) announced today an investment commitment of up to $20 million in the Township of Mapleton's water and wastewater project.
- CIB's commitment will provide low-interest and flexible financing to proponents balanced with risk transfer to the private sector.
- The Mapleton commitment is consistent with the CIB's mandate to invest in green infrastructure and attract private capital into revenue generating projects.
- The Township is seeking a company to design, build, finance, operate and maintain the municipalities' new and existing water and wastewater infrastructure for up to 20 years.
- CIB is focused on transformational projects that are in the public interest. Public transit, trade and transportation and green infrastructure, as well as broadband, are the priority sectors for investment.

QAs

Q. What is CIB's investment commitment?

CIB is investing up to $20 million in the Township of Mapleton's water and wastewater project. CIB is partnering with the Township, who will lead procurement. This investment is not a grant – it is a debt funding commitment to assist proponents in obtaining flexible and low-cost financing, and to attract additional investment from other partners

Q. What is the Township of Mapleton's water project?

The Township is seeking a partner to design, build, finance, operate and maintain the municipalities' new and existing water and wastewater infrastructure for up to 20 years.

Mapleton's immediate infrastructure needs include increasing the Township's water tower storage, upgrading an existing water pumping station, a wasterwater treatment project and a gravity sanitary collection system.

Q. What part of the project are you financing?

The CIB's loan will help finance a proportion of the construction of new water and wastewater infrastructure and ongoing major maintenance and rehabilitation of the system with the remainder being funded by the private sector.

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Q. Why is CIB providing financing for this project?

The Mapleton commitment is consistent with the CIB's mandate to invest in green infrastructure and attract more private investment into projects.

CIB is focused on transformational projects that are in the public interest. Public transit, trade and transportation, green infrastructure and broadband, are the priority sectors for investment.

This partnership demonstrates how the CIB can enable the public and private sectors to improve infrastructure delivery in Canada and help the Township of Mapleton continue to provide households and businesses access to clean drinking water using modern infrastructure.

[redacted]

Q. Would the project not move forward without CIB financing or investment of involvement?

[redacted]

The project is a new model demonstrating how the CIB can partner with municipalities across Canada to attract private sector capital to improve financing related to upgrading aging water and wastewater systems.

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Q. What are the financing rates you are charging? How does this compare to current lending rates?

CIB's low interest investment is expected to be up to $20 million over a 20-year period. [redacted]

[redacted]

Q. When does the financing flow to Mapleton or ProjectCo?

[redacted]

Q. When will CIB's financing be paid back?

[redacted]

Q. How much will the Mapleton water project cost?

All questions about procurement timelines, project cost and other project details should be directed to Mapleton. Projected Mapleton water project costs are between $15 and $30 million over the 20 year term.

Q. In laypersons' language, how exactly will CIB's involvement ensure greater risk transfer to the private sector?

It is a condition of our investment that adequate risk be transferred to the private sector underpinned by adequate private capital. The project partner will be subject to design, build, finance, operating, maintenance and revenue risk from the outset as part of the project agreement.

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[redacted]

Mapleton will focus on its core role as asset owner and water utility regulator and will hold the selected proponent accountable to deliver the water and waste water infrastructure.

Q. What kind of risk is CIB taking on?

[redacted]

Q. Which bidder do you think would be most suitable for your financing?

CIB's financing will be standardized and made available to all proponents of the project equally and fairly.

Q. What other projects are you financing?

CIB recently announced an investment commitment of $2 billion for GO Expansion.

CIB has previously invested $1.28 billion in the Réseau express métropolitain (REM) project.

CIB committed $55 million to take the high-frequency train project between Quebec City and Toronto to the next step by conducting an additional due diligence exercise in collaboration with VIA Rail Canada.

Q. What if there is a change in federal government? What happens to this project money?

[redacted]

Q. As a lender, what kind of oversight will you have over your investment?

[redacted]

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[redacted]

Q. What is the CIB decision-making process that lead to this announcement?

Two key assessments are applied to projects. One is assessing the public interest of a project and two, is whether the project can generate revenue and attract private sector investment. We independently assess, negotiate and invest in projects with public sponsors and private and institutional investors. Our Board of Directors review all our investment decisions.

[redacted]

Q. What was the Township of Mapleton's decision-making process?

The Township issued a request for qualifications in April 2019. After selecting prequalified teams, Mapleton issued a request for proposals to the prequalified teams on July xx, 2019.

Q. This is CIB's first green / water project. What other sectors is the CIB exploring? What are the next projects and when will they come?

CIB is focused on transformational projects that are in the public interest. Public transit, trade and transportation and green infrastructure, as well as broadband are priority sectors for investment.

As noted in the federal budget, priority projects now also include exploring how best to expand broadband in Canada and developing intergovernmental electricity transmission (interties).

Q. Critics say CIB has moved slowly with its investments. What do you say to that?

In less than one year, we have invested almost 10% of our total capital.

We have already spoken to more than 10,000 people including 310 meetings with domestic and international investors, public sector leaders and Indigenous partners.

We needed to understand what the opportunities were and how CIB could invest and ensure projects meet our public interest test and are bankable. Good due diligence takes time.

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Q. Is CIB subsidizing private sector profits?

CIB closely reviews project structures to ensure that risks are allocated optimally and that returns are reasonable and commensurate with the risks taken by investors.

Q. Besides Mapleton, why are CIB's other three deals in Quebec and Ontario? Is CIB only focusing only on projects in central Canada?

We are open to investing in projects across Canada. Mapleton and the three transit projects were the most developed opportunities to invest in. [The CIB is in active due diligence on several other opportunities across the country].

Township of Mapleton – Background

Mapleton, a rural community of approximately 11,000 residents, is seeking a private sector partner (the "Concessionaire") to enter into up to a 20-year Concession Agreement to design, build, finance, operate and maintain ("DBFOM") the Municipality's new and existing water and wastewater infrastructure. Mapleton will continue to own all existing and new infrastructure assets.

Mapleton has some immediate infrastructure investment needs:

- a new water tower
- upgrading an existing water pumping station
- a wastewater treatment project
- a gravity sanitary collection system in Moorefield

Mapleton is financing its water assets through a relatively new and innovative approach. Its existing municipal debt capacity can be preserved for other municipal priorities. An innovative approach will protect water system ratepayers from potential costly water rate increases due to needed water infrastructure additions.

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THE CORPORATION OF THE TOWNSHIP OF MAPLETON COUNCIL

THURSDAY, JULY 11, 2019

RESOLUTION 2019-19- 11
After Rise and Report
Moved: Councillor DOUGLAS Seconded: Councillor MARTIN

WHEREAS pursuant to Township of Mapleton Resolution 2019-15-03, which became effective May 28, 2019, Mapleton approved the Request For Qualifications ("RFQ") Proponents in order to proceed to issue them with the Request For Proposals ("RFP") in connection with water and wastewater system renewal and expansion within the municipality under a regulated public utility concession model (the "Project").

AND WHEREAS the Township of Mapleton is the owner of its public water and wastewater assets;

AND WHEREAS the Canadian Infrastructure Bank ("CIB") is a federal Crown Corporation whose mandate is to invest $35 billion in new, revenue generating infrastructure projects including green infrastructure such as municipal water and wastewater projects;

AND WHEREAS the CIB has made an investment commitment of up to $20 million with respect to the Project in the form of a debt financing package (the "CIB Financing Option");

AND WHEREAS Council wishes to extend the CIB Financing Option to all Proponents;

AND WHEREAS PriceWaterhouseCoopers ("PwC") has prepared a business case which concludes that the Project with the CIB Financing Option is the best alternative for water and wastewater infrastructure renewal and expansion for the Township.

BE IT RESOLVED THAT:

1. The Township invites CIB to participate in its Project in the context of including the CIB Financing Option as part of Council's approved RFQ/RFP. The terms and other details associated with the CIB Financing Option constitute Confidential Information as defined in the Non-Disclosure Agreements executed with all Proponents with respect to the Project.

2. The Township approves the public release of the redacted PwC business case contained in the PwC report entitled *"Township of Mapleton Water-Wastewater Project Business Case"* dated July 11, 2019.

3. This Resolution **2019-19-** 11 shall become effective July 11, 2019.

(defeated)/carried

Head of Council

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Township of Mapleton Water-Wastewater Project

Business Case

FINAL

July 11, 2019

pwc

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Notice to Reader

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This document relies on information, data, opinions and declarations supplied by representatives, agents or subcontractors of Mapleton. PwC presumed the information which it has received to be complete and accurate. Accordingly, PwC will not be held responsible for any damage caused to anyone as a result of the use of such information.

The results and analyses presented in this document are based on the studies completed to date as part of the Mapleton Water-Wastewater Project.

Subsequent studies conducted for the Mapleton Water-Wastewater Project may result in analyses and conclusions which differ significantly from those found herein.

In addition, this report contains prospective financial information. We have not examined such prospective financial information in accordance with standards established by the Chartered Professional Accountants of Canada, and we express no assurance of any kind on such information. Given that such prospective information is based on assumptions related to future events, actual outcomes may differ from those presented. In the event where such assumptions materialize, resulting discrepancies may be significant.

All amounts in this report are stated in Canadian currency unless otherwise noted.

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PwC refers to the Canadian member firm, and may sometimes refer to the PwC network. Each member firm is a separate legal entity. Please see www.pwc.com/structure for further details.

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Executive Summary

Project Overview

The Township of Mapleton's (the "Township" or "Mapleton") water and wastewater networks face significant challenges in the coming years to deliver new infrastructure while maintaining high service standards on the existing networks. For example, Mapleton must make between $15 million to $30 million in capital investments over the next 20 years in net new infrastructure ("New Infrastructure") to prepare for Mapleton's expected growth, including a new water tower, upgrading an existing water pumping station, a wastewater treatment pilot project, and a gravity sanitary collection system in Moorefield, ON. This comes on top of the need to effectively and efficiently manage existing infrastructure like the water and wastewater systems in Drayton, ON and Moorefield, ON as well as performing sewage treatment works.

Were Mapleton to make these investments in New Infrastructure and manage the existing networks themselves, they would face difficulty due to:

- Provincially-imposed borrowing limits that would place significant financial strain on the Township's debt capacity to deliver these investments let alone other municipal services (e.g., policing, roads, waste management, fire services, parks and recreation, etc.);
- Potentially large increases in the water and wastewater rates paid by consumers required in order to cover these costs; and
- The technical and operational expertise required to deliver complex infrastructure projects of this sort.

To address these issues, Mapleton is examining the possibility of selecting a private party or consortium ("Concessionaire") to assume responsibility for its water and wastewater networks under a concession that would create a regulated utility ("Concession Model" or "Project"). The Concession Model would have the following traits:

Table 1: Concession Model Traits

Trait	Concession Model
Term	20 years
Estimated cost of New Infrastructure	$15 million to $30 million over term of concession
Scope of services	• Operate, maintain, and finance existing water and wastewater infrastructure; and • Design, build, finance, operate, and maintain new water and wastewater infrastructure.
Rate-setting and rate-making function	Mapleton
Ownership of assets	Mapleton
Access to existing assets	Concessionaire (via lease or fixed term operating license from Mapleton)
Capital structure	60%/40% debt/equity ratio (prescribed by Mapleton)
Compensation structure	Return on equity comparable with other regulated monopoly utilities (e.g., electricity distribution)
Depreciation	Concessionaire is able to take advantage of depreciation expensing throughout the concession term (which could offer tax planning benefits to ratepayers)

As part of this, Mapleton retained Borden Ladner Gervais LLP ("BLG") as legal advisor and PricewaterhouseCoopers LLP ("PwC") as financial advisor.

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To select a private party to deliver the Concession Model, Mapleton issued a Request for Qualifications ("RFQ") on April 3, 2019. By the April 30, 2019 deadline, the RFQ received qualifications from six respondents, all of which have been prequalified ("Proponents") to move onto the Request for Proposals ("RFP") stage:

- *Helios Group* – Industrial Alliance Insurance and Financial Services, Pomerleau, Helios Group, JL Richards and GSS Engineering
- *Maple Reindeers W/WW Utility* – Wood Canada, Maple Reinders Constructors, ASI Water, Stonebridge Financial Corporation
- *Maple Water Resource Partners* – EPCOR Water, AECON, Ontario Clean Water Agency and Stantec
- *Ontario Utility Consortium* – Veolia Water Canada, Graham, CIMA+, Alectra Inc. and Enbridge
- *Peterborough Group* – PUG (Peterborough) Services Corp., Peterborough Utilities, Peterborough Utilities
- *PUC Sault St. Marie Group* – Axium Infrastructure Canada, PUC Services (Sault St. Marie) and Ontario Energy Holdings

Purpose of the Business Case

This business case is intended to examine the status quo for delivering water and wastewater infrastructure in Mapleton, the Concession Model, and the Concession Model with CIB Financing (described below) to analyze all options under consideration.

Mapleton's Objectives

In examining how to deliver its water and wastewater infrastructure, Mapleton established the following objectives and guiding principles in its RFQ:

- Retain Mapleton's role as a regulator;
- Partner with a reputable party;
- Require the party to have financial, technical, or operational capacity or expertise Mapleton may lack;
- Minimize the financial burden on Mapleton's taxpayers when financing New Infrastructure;
- Mitigate significant escalation of unplanned and unanticipated increases in rates;
- Maintain an appropriate capital structure;
- Maintain Mapleton's borrowing capacity;
- Maintain public ownership of assets;
- Deliver safe and reliable service;
- Reduce environmental impacts;
- Realize a competitive development charge regime;
- Deliver equal or better service levels;
- Work cooperatively and productively with Mapleton's economic development and planning departments; and
- Explore additional economic opportunities.

Canada Infrastructure Bank Financing

The Canada Infrastructure Bank's ("CIB") mandate is to invest $35 billion into new, revenue-generating infrastructure projects in cooperation with public sponsors and private sector investors across four priority sectors: public transit, trade and transportation, green infrastructure, and broadband. The CIB co-invests alongside private and institutional investors and provides advisory services to potential project sponsors. By engaging the expertise and capital of private and institutional investors, the CIB seeks to provide more infrastructure for Canadians.

The CIB was invited to participate in the project by Mapleton's council ("Council") in July 2019. The CIB is offering a 'stapled' financing solution ("CIB Financing") to all Proponents during the RFP stage, which is an innovative and flexible financing option for the project that will contribute to both the financial and environmental sustainability of the water and wastewater networks. The CIB Financing is an option available to all bidders, but will be at their discretion as to whether or not to include it as part of their bid.

The CIB Financing would involve a $20 million senior secured credit facility for the entirety of the 60% debt portion of the capital structure. The facility will have a [redacted] draw period. [redacted] The interest rate [redacted]. The minimum debt service coverage ratio ("DSCR") would be [redacted].

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Participation by the CIB in the project is expected to support Mapleton to achieve its principles and objectives for the project, and the CIB will gain experience in this green infrastructure sector and demonstrate in the Canadian market a new innovative approach to financing a concession for small municipal water and wastewater networks. As a pilot project, the Mapleton project represents a next step for municipalities and the CIB to assess best practices and further consider new models for concessions of publicly-owned municipal water and wastewater systems across Canada. This could, in turn, further increase investment in the sector and leverage the involvement of private and institutional investment partners in future projects involving publicly-owned water and wastewater networks.

Options Under Consideration

Table 2 summarizes the three options under consideration. To ensure a consistent understanding of these options, the definitions below have been reviewed and agreed to by representatives of Mapleton. All options involve Mapleton retaining ownership of the water and wastewater networks at all times. The traits of these models are potentially subject to change should Mapleton enter into a project agreement with a Concessionaire (which could contain different roles and responsibilities):

Table 2: Options Under Consideration

Status Quo	Concession Model	Concession Model with CIB Financing
• Mapleton continues to provide public utility services for its water and wastewater infrastructure. • Mapleton finances capital expenditures through public debt issuances, rates, and/or development charges. • Mapleton procures design and construction contracts as required for capital expenditures (assumed to resemble Design-Bid-Build arrangements). • Mapleton undertakes operations and maintenance in-house or contracts out these services. • Mapleton assumes responsibility for billing and collection of rate revenue.	• Mapleton solicits proposals for water and wastewater services (under a Concession Model) that are currently performed by the Township. • Agreement includes responsibility to design, build, finance, operate, and maintain both the existing networks and New Infrastructure. • Mapleton retains control of the rate-setting and rate-making functions. • Debt and equity is raised by the Concessionaire under a 60%/40% debt to equity ratio (debt may be sourced from either private markets or on-balance sheet financing from the Concessionaire). • Project agreement assumed to contain detailed handback provisions. • Rate setting process would involve a Township committee that makes a recommendation to Council (who would then vote to approve/ disapprove rates the Concessionaire could charge to cover costs and generate the allowed return on equity). • Concessionaire would have the option of structuring their financial bid to include a lease of existing infrastructure or as a fixed	• Identical traits as the Concession Model except for the financing component. • While the financing structure remains a 60%/40% debt to equity ratio, the debt financing is sourced from the CIB at lower cost and with added flexibility than private market debt. • Equity continues to be provided by the Concessionaire.

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Status Quo	Concession Model	Concession Model with CIB Financing
	term operating license (which could offer tax advantages). • Concessionaire has greater ability to take advantage of depreciation expensing throughout the concession term (which could offer tax planning benefits to ratepayers). • Mapleton retains responsibility for billing and collection of rate revenue, with rate revenue then remitted to the Concessionaire.	

There has not been a history of small municipally-owned water and wastewater systems entering into concession agreements in Canada. However, there are several precedent water and wastewater projects in other jurisdictions that possess some of these same traits.

Risk Analysis

PwC conducted a risk analysis with Mapleton to identify the Project's risk-adjusted whole-of-life costs and the expected retained risk by the Township under the three delivery models. This involved identifying, defining, and quantifying a list of 22 risks associated with the project. The risk analysis was limited to these 22 risks due to the time constraints to complete the business case before RFP issuance.

Prior to the workshop, PwC used knowledge derived from previous water and wastewater projects to pre-populate the risk register with probability, impact, and allocation figures for each risk in order to facilitate a productive, concise discussion. Representatives of Mapleton and PwC then discussed the estimations of the probability, impact, and allocation for each risk based on their experience in the water and wastewater sector and the experience of Mapleton representatives with capital project delivery and the specific requirements of this project. Mapleton then agreed to figures for each risk, which served as the basis for PwC's quantification of risks.

This process produced results demonstrating that the Status Quo entails significantly more retained risk for Mapleton than either the Concession Model or Concession Model with CIB Financing. Results of the risk quantification are shown below, expressed in net present value ("NPV") terms.

Table 3: Retained Risk Values (NPV)

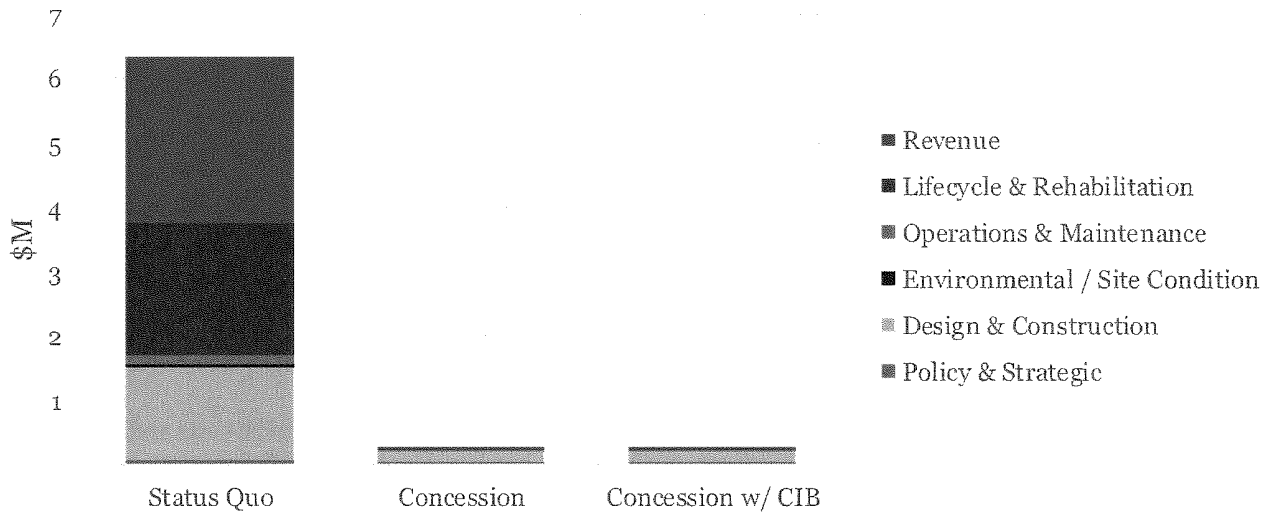
Cost Base ($NPV)	Status Quo	Concession Model	Concession Model with CIB Financing
Policy & Strategic	$58,033	$24,456	$23,484
Design & Construction	$1,443,360	$157,961	$157,961
Environmental / Site	$64,020	-	-
Operations & Maintenance	$117,443	$35,785	$35,785
Lifecycle & Rehabilitation	$2,061,284	$23,625	$23,625

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Revenue	$2,602,412	$14,852	$14,852
Total	**$6,346,552**	**$256,679**	**$255,707**

The figure below graphically offers a comparison of retained risk for each of the delivery options.

Figure 1: Retained Risk Graph (NPV)



The Status Quo entails substantially more risk than the other two models in large part due to higher probabilities, impacts, and allocation to Mapleton when it comes to the rate setting process (i.e., rates not covering costs), the residual value of the networks at the end of the concession term, higher than expected construction and rehabilitation costs, and significant escalation of unplanned and unanticipated increases in rates due to future capital expenditures.

By contrast, the Concession Model and Concession Model with CIB Financing reduce these risks through private sector incentives to minimize costs (including the risk Mapleton – as regulator – declines to approve requested cost increases for unnecessary or inefficient expenditures) and drawing on their technical, operational, and financial expertise in delivering water and wastewater networks.

Financial Impact on Ratepayers

PwC conducted a financial analysis of the impact on ratepayers if Mapleton were to deliver its water and wastewater networks under the Status Quo model, Concession Model, or Concession Model with CIB Financing.

Rates for each of Mapleton's water and wastewater networks fall into two categories: (1) base rates; and (2) consumptive rates. Within consumptive rates, there are two blocks of consumers: Block 1 and Block 2.

PwC's analysis held base rates constant (save annual increases for the number of consumers), drawing on projected figures developed by Watson & Associates. PwC instead focused on calibrating the consumptive rates for Block 1 and Block 2 (for each of the water and wastewater networks) based on the annual consumption forecasts provided by Watson & Associates. Per instructions from Mapleton, PwC assumed development charges would be used to help fund the water and wastewater networks, thereby reducing the rates charged to consumers in order to cover costs. PwC then calculated the consumptive rates needed to cover costs under each delivery model, given the different financing structures of each. Under the concession models, this includes the rate revenue required to return all capital invested by the Concessionaire to develop New Infrastructure. This includes a reserve that helps ensure Mapleton has accumulated the funds needed to return capital invested by the Concessionaire in New Infrastructure at the end of the concession term, thus avoiding the

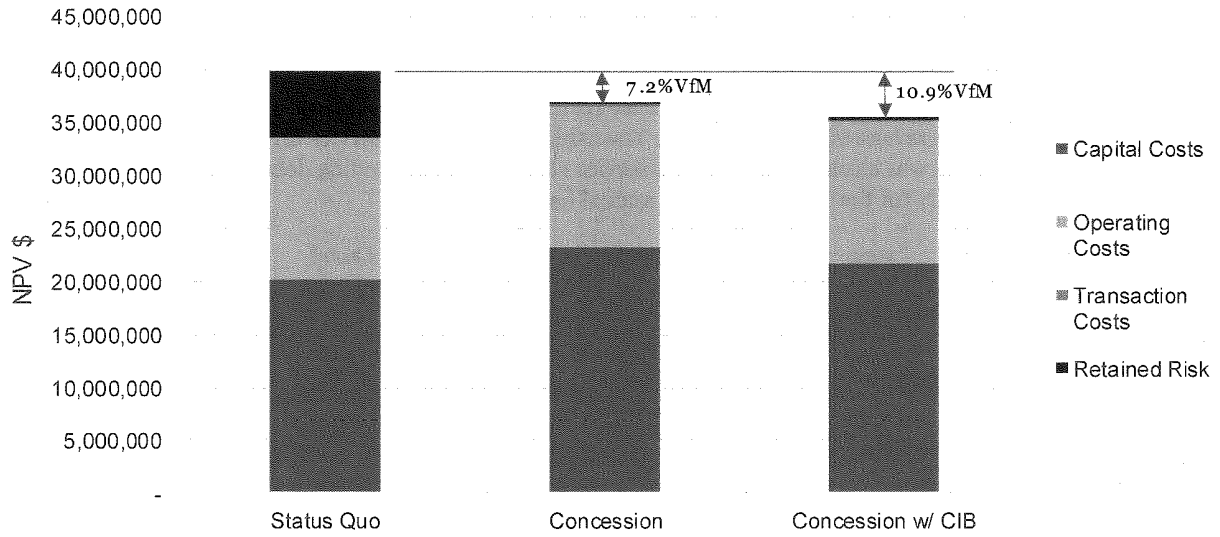
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need to increase taxes to cover costs related to the networks. Any cost differences between models will be reflected in the consumptive rates comparison.

Please note that any potential efficiencies related to capital and operating spending that could be brought by the private sector have not been considered in this analysis due to the uncertainty around the amount and timing of any potential savings.

Limiting the financial analysis to a cash flow basis fails to fully capture the benefits and costs of different delivery models; instead, delivery models should be compared on a risk-adjusted NPV basis to allow for a full comparison of all Project costs on a value for money basis. A risk-adjusted NPV comparison of delivery models shows that the Concession Model with CIB Financing produces the best value for money.

Figure 2: Mapleton – Value for Money Comparison (Risk-Adjusted NPV Basis)



This is largely due to:

- The Status Quo model seeing Mapleton retain significant risk related to the rate setting process;
- Residual asset value;
- Higher than expected construction and rehabilitation costs;
- Significant escalation of unplanned and unanticipated increases in rates;
- The effect of private sector incentives minimizing the cost of risk under the Concession Model with CIB Financing model; and
- The lower cost of financing under this model as compared with the Concession Model.

Other important findings or assumptions from the financial analysis include:

- On a cash flow basis, the Status Quo model results in large spikes to rates as a result of funding 50% of capital and lifecycle expenditures directly through rate revenue in a given year (with the remaining 50% funded via debt issuance that requires future ratepayers to repay debt service costs via higher rates);
- Few precedents exist for project financings of water and wastewater projects the size of Mapleton's. Therefore, it was assumed that the Concession Model would see debt provided from the Concessionaire's balance sheet consistent with the corporate debt rates of utilities. The figures used do not take account of any risk premium or transaction costs that may be added to these rates, or potential differences in borrowing rates amongst private parties of different size and creditworthiness;
- The structure of the CIB Financing (based on the terms current to the publishing of this business case) would offer the Concessionaire considerable flexibility to draw on debt as needed. This would help address the uneven capital spending schedule Mapleton has developed for New Infrastructure, which would otherwise require

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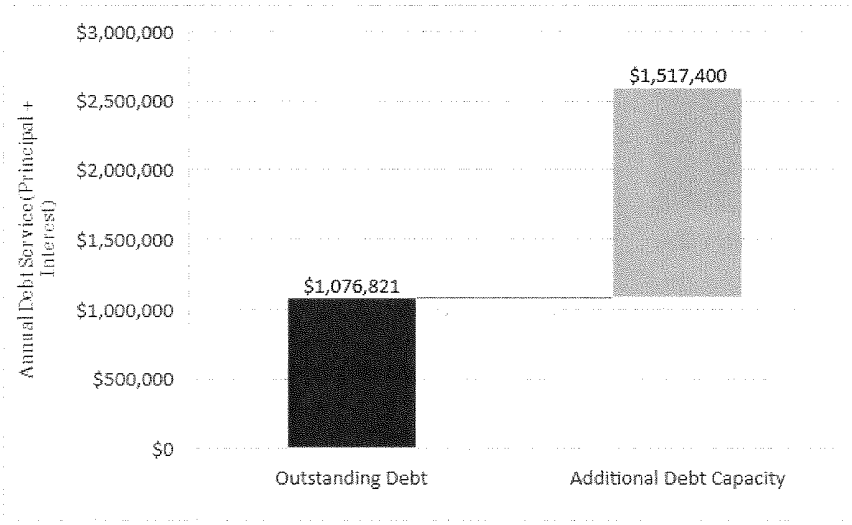
significant debt issuance from the Town and/or significant increases in rates in the years where investments are made;

- Under either concession model, should bidders structure their financial submission to include rent payments to Mapleton for access to the existing infrastructure (who would retain ownership of water and wastewater assets at all times), BLG believes this could allow the Concessionaire to claim these rent payments as a deductible expense for tax purposes. This could allow the Concessionaire to reduce the rate revenue required from consumers to cover capital and operating costs and generate a return; and
- Bidders may choose to structure their bid to take advantage of depreciation that generates tax savings that lowers required rate revenue. Given the difficulty ascertaining which structure this might take, the financial model has not attempted to calculate these tax savings and instead focuses on the required rate revenue stemming from the networks' expected capital and operating needs. This approach was adopted to offer a conservative view of the required rate revenue under each model; therefore, bids received through the RFP process could produce lower rates than those projected in the financial model.

Borrowing Capacity Limit

Under provincial legislation, Mapleton's annual debt service (principal and interest) faces a borrowing capacity limit equal to 25% of net municipal revenues. As of 2018, the Township's annual debt service limit totaled $2,594,222 of which $1,076,821 (or ~41.5%) was already used for debt service charges on outstanding debt.[1] This leaves $1,517,400 in additional debt service capacity for the Township on an annual basis.[2]

Figure 3: Mapleton – Additional Borrowing Capacity (Annual Basis)

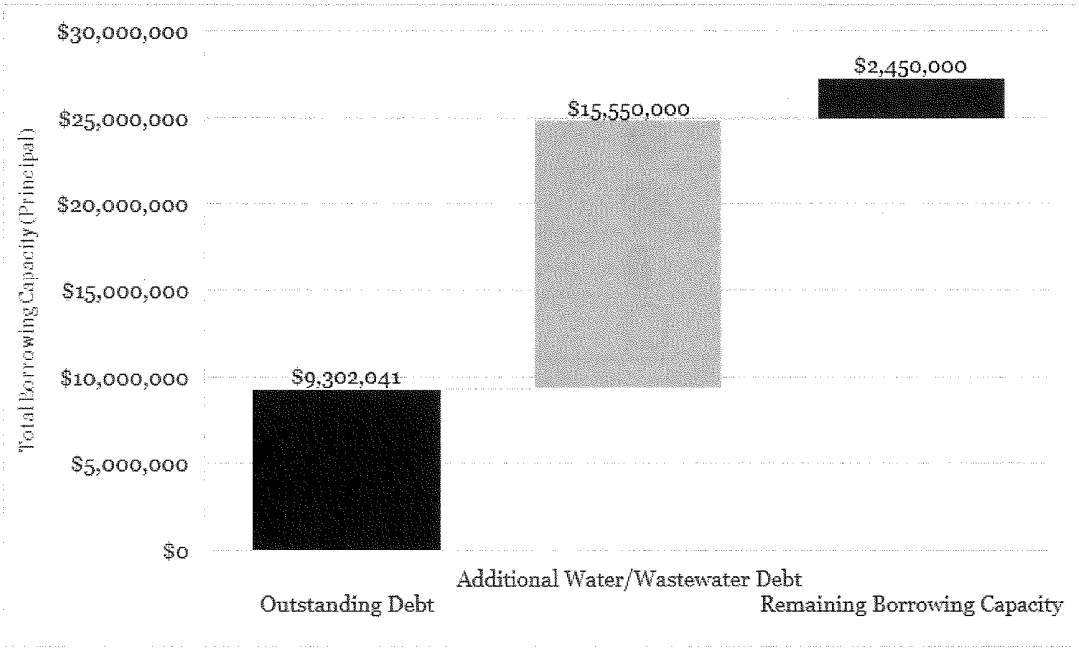


Mapleton estimates that this $1,517,400 in annual debt service would allow the Township to issue an additional $18,000,000 (principal basis) in debt before hitting their limit.[3] Watson & Associates estimates Mapleton would need to issue ~$15,550,000 in additional debt by 2028 in order to finance 100% of the anticipated capital works for water and wastewater; therefore, this debt would consume ~86.4% of the Township's additional debt capacity.[4] This means that if Mapleton financed their future water and wastewater investments themselves, it would leave very limited debt capacity to finance capital expenditures required for other services (e.g., policing, roads, waste management, fire services, parks and recreation, etc.).

[1] Per June 14, 2019 guidance from the Township of Mapleton.
[2] Per June 14, 2019 guidance from the Township of Mapleton.
[3] Per June 14, 2019 guidance from the Township of Mapleton.
[4] Per June 17, 2019 update to Watson & Associates rate study.

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Figure 4: Remaining Borrowing Capacity Under Status Quo Model



Moreover, this financial stress would be exacerbated if any of the following occurred: municipal tax revenues did not materialize as expected; water and wastewater CAPEX went over budget; and/or interest rates increased. The possible implications of this erosion of Mapleton's borrowing capacity include: reductions to or delays in necessary water and wastewater CAPEX; reductions to or delays in investments in other municipal services; increases in water and wastewater rates, development charges and/or taxes; and/or exceeding the Township's legal borrowing limit.

Therefore, unless Mapleton is willing and able to make a long-term budgetary commitment to using their remaining borrowing capacity to finance its water and wastewater network, the Township's debt limit poses significant challenges for the viability of the Status Quo model given the CAPEX requirements.

Qualitative Analysis

PwC also compared Mapleton's stated objectives for the Project (as set out in the April 3, 2019 RFQ) with each of these delivery options. This showed that the Concession Model with CIB Financing best meets the objectives Mapleton established for delivery of its water and wastewater network.

LEGEND:

High ● Medium ◐ Low ○

Table 4: Summary – Qualitative Analysis

Objective	Status Quo	Concession Model	Concession Model with CIB Financing
Mapleton as regulator	●	●	●
Reputable party	●	●	●
Financial, technical, and operational	○	●	●

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Objective	Status Quo	Concession Model	Concession Model with CIB Financing
expertise and capacity to deliver project			
Maintain public ownership of assets	●	●	●
Safe and reliable service	●	●	●
Reduced environmental impact	◑	◑	◑
Competitive development charges	○	●	●
Equal or better service levels	◑	● (Anticipated)	● (Anticipated)
Cooperative working relationship with Mapleton	●	◑	●
Explore additional economic opportunities	○	●	●

In addition to the benefits noted above, the Concession Model with CIB Financing offers other qualitative benefits:

- Allows Mapleton to focus on their core role as a regulator instead of project delivery (which is better-suited for third parties with extensive experience in that role);
- Improves cost certainty for ratepayers by virtue of rate application cycles establishing the asset base from which rates will be derived;
- Offers service guarantees by virtue of the project agreement presumably including key performance indicators the Concessionaire must achieve;
- Helps Mapleton access the latest technology to maximize service quality by virtue of the incentive for the Concessionaire to propose including new technology in the asset base;
- Transferring responsibility for the networks to a single consortium allows for a whole-of-lifecycle approach to managing the network, thus mitigating integration risk; and
- The proposed 20-year concession allows for a possible re-tendering opportunity at the end of the term. This creates an incentive for the Concessionaire to deliver strong performance during the concession to avoid being replaced at the end of the term due to poor performance.

Conclusions

PwC's analysis indicates that the Concession Model with CIB Financing is the best option to deliver Mapleton's water and wastewater networks given the financial, risk, and qualitative benefits it offers. This is due not only to it offering the lowest risk-adjusted NPV of all options but also the significant qualitative benefits of the model (when compared against the objectives Mapleton has established for its water and wastewater networks).

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1. Background

1.1 Project Overview

The Township of Mapleton's (the "Township" or "Mapleton") water and wastewater networks face significant challenges in the coming years to deliver new infrastructure while maintaining high service standards on the existing networks. For example, Mapleton must make between $15 million to $30 million in capital investments over the next 20 years in net new infrastructure ("New Infrastructure") to prepare for Mapleton's expected growth, including a new water tower, upgrading an existing water pumping station, a wastewater treatment pilot project, and a gravity sanitary collection system in Moorefield, ON. This comes on top of the need to effectively and efficiently manage existing infrastructure like the water and wastewater systems in Drayton, ON and Moorefield, ON as well as performing sewage treatment works.

Were Mapleton to make these investments in New Infrastructure and manage the existing networks themselves, they would face difficulty due to:

- Provincially-imposed borrowing limits that would place significant financial strain on the Township's debt capacity to deliver these investments let alone other municipal services (e.g., policing, roads, waste management, fire services, parks and recreation, etc.);
- Potentially large increases in the water and wastewater rates paid by consumers required in order to cover these costs; and
- The technical and operational expertise required to deliver complex infrastructure projects of this sort.

To address these issues, Mapleton is examining the possibility of selecting a private party or consortium ("Concessionaire") to assume responsibility for its water and wastewater networks under a concession that would create a regulated utility ("Concession Model" or "Project"). The Concession Model would have the following traits:[5]

Table 5: Concession Model Traits

Trait	Concession Model
Term	20 years
Estimated cost of New Infrastructure	$15 million to $30 million over term of concession
Scope of services	• Operate, maintain, and finance existing water and wastewater infrastructure; and • Design, build, finance, operate, and maintain new water and wastewater infrastructure.
Rate-setting and rate-making function	Mapleton
Ownership of assets	Mapleton
Access to existing assets	Concessionaire (via lease or fixed term operating license from Mapleton)
Capital structure	60%/40% debt/equity ratio (prescribed by Mapleton)
Compensation structure	Return on equity comparable with other regulated monopoly utilities (e.g., electricity distribution)
Depreciation	Concessionaire is able to take advantage of depreciation expensing throughout the concession term (which could offer tax planning benefits to ratepayers)

[5] Per Mapleton's Request for Qualifications document issued April 3, 2019

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To assist in examining the Concession Model and selecting a Concessionaire, Mapleton retained Borden Ladner Gervais LLP ("BLG") as legal advisor and PricewaterhouseCoopers LLP ("PwC") as financial advisor.

1.2 Overview of Competitive Process

In order to select a Concessionaire to deliver the Concession Model, Mapleton opted to pursue a competitive process. This involves a three-stage procurement process, including a:

1. Request for Qualifications ("RFQ")

The RFQ stage was intended to identify Prequalified Parties to participate in the Request for Proposals ("RFP") stage. Please refer to Appendix A for additional details on the RFQ stage.

The RFQ stage saw six bids submitted from the following consortia ("Proponents"):

- *Helios Group* – Industrial Alliance Insurance and Financial Services, Pomerleau, Helios Group, JL Richards and GSS Engineering
- *Maple Reindeers W/WW Utility* – Wood Canada, Maple Reinders Constructors, ASI Water, Stonebridge Financial Corporation
- *Maple Water Resource Partners* – EPCOR Water, AECON, Ontario Clean Water Agency and Stantec
- *Ontario Utility Consortium* – Veolia Water Canada, Graham, CIMA+, Alectra Inc. and Enbridge
- *Peterborough Group* – PUG (Peterborough) Services Corp., Peterborough Utilities, Peterborough Utilities
- *PUC Sault St. Marie Group* – Axium Infrastructure Canada, PUC Services (Sault St. Marie) and Ontario Energy Holdings

Mapleton's Council opted to prequalify all six consortia to move onto the RFP stage.

2. Request for Proposals ("RFP")

The RFP stage is a competitive process that is intended to result in the identification of a Proponent with whom Mapletown will negotiate a final agreement ("Preferred Proponent"). At the time this business case was finalized, the RFP had yet to be finalized; however, it is expected to have the following traits (potentially subject to change):

- A description of the Project and future capital and operational requirements;
- Bidders will be expected to submit a draft lease or a fixed term operating license (for the existing infrastructure) and project agreement (for delivery of the new and existing infrastructure); and
- A description of the rate application and approval process.

The RFP is currently scheduled for release in July 2019.

3. Implementation

Once the Preferred Proponent has executed the project agreement (or "Project Documentation"), the Project will proceed to implementation. This will involve the Concessionaire assuming responsibility for the operations and maintenance of the existing networks and design, construction, financing, operations, and maintenance of any new infrastructure. At the time this business case was finalized, this was expected to occur in late 2019 (subject to change).

1.3 Canada Infrastructure Bank Financing

The Canada Infrastructure Bank's ("CIB") mandate is to invest $35 billion into new, revenue-generating infrastructure projects in cooperation with public sponsors and private sector investors across four priority sectors: public transit, trade and transportation, green infrastructure, and broadband. The CIB co-invests alongside private and institutional investors and provides advisory services to potential project sponsors. By engaging the expertise and capital of private and institutional investors, the CIB seeks to provide more infrastructure for Canadians.

The CIB was invited to participate in the project by Mapleton's council ("Council") in July 2019. The CIB is offering a 'stapled' financing solution ("CIB Financing") to all Proponents during the RFP stage, which is an innovative and flexible financing option for the project that will contribute to both the financial and environmental sustainability of the water

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and wastewater networks. The CIB Financing is an option available to all bidders, but will be at their discretion as to whether or not to include it as part of their bid.

The CIB Financing would involve a $20 million senior secured credit facility for the entirety of the 60% debt portion of the capital structure. The facility will have a [redacted] draw period. [redacted] The interest rate [redacted] The minimum debt service coverage ratio ("DSCR") would be [redacted].

Participation by the CIB in the project is expected to support Mapleton to achieve its principles and objectives for the project, and the CIB will gain experience in this green infrastructure sector and demonstrate in the Canadian market a new innovative approach to financing a concession for small municipal water and wastewater networks. As a pilot project, the Mapleton project represents a next step for municipalities and the CIB to assess best practices and further consider new models for concessions of publicly-owned municipal water and wastewater systems across Canada. This could, in turn, further increase investment in the sector and leverage the involvement of private and institutional investment partners in future projects involving publicly-owned water and wastewater networks.

1.4 Purpose of the Business Case

This business case is intended to provide a comparative analysis of the status quo for delivering water and wastewater infrastructure in Mapleton, the Concession Model, and the Concession Model with CIB Financing to analyze all options under consideration.

This analysis will be conducted by analyzing the:

- Financial impact to ratepayers through the development of a detailed cash flow model;
- Qualitative and strategic impact to Mapleton; and
- Quantitative impact due to risk allocations, probabilities, and impacts under the aforementioned three options.

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2. Project Objectives

2.1 Mapleton's Objectives

The table below sets out the objectives and guiding principles for the Project Mapleton listed in the RFQ:

Table 6: Mapleton's Objectives

Objective	Description
Mapleton as regulator	An approach that produces a regulated utility model outcome through the Project Documentation (regulation by contract) whereby Mapleton's Council will act as regulatory authority in terms of establishing water and wastewater rates, considering and approving all New Infrastructure capital expenditures as required, enforcing reliability, service quality and other performance measures as agreed by the parties. In exchange, the Preferred Proponent will be provided with the opportunity to earn a rate of return on the notional rate base comprising the Mapleton water/wastewater system. Rate base will include all approved water/wastewater infrastructure capital expenditures made by the Concessionaire pursuant to the Project Documentation and investments approved by Mapleton.
Reputable party	The engagement of a reputable and experienced Preferred Proponent that is capable of carrying out all of the obligations under the Project Documentation for the duration of the 20 year term.
Financial, technical, and operational expertise and capacity to deliver project	Require a Preferred Proponent to undertake New Infrastructure for which Mapleton may not have the financial, technical or operational capacity or expertise.
Minimize taxpayer burden	Minimize the burden on Mapleton's taxpayers with respect to the financing of New Infrastructure.
Mitigate significant escalation of unplanned and unanticipated increases in rates	Mitigate the risk of immediate, unpredictable and large spikes in water/wastewater rates to finance New Infrastructure. Mapleton's objective is neither to limit water/wastewater rates at current levels or limit rate increases to inflationary adjustments over the term of the Project Documentation; rather, Mapleton's intent is to ensure smoother, reasonable but necessary and planned rate increases with respect to justifiable and prudent New Infrastructure investments and the ongoing maintenance and operation of the water/wastewater system in general.
Capital structure	Mapleton considers a 60%/40% debt/equity ratio to be the appropriate notional capital structure with respect to the Project and the allowed return on equity which the Preferred Proponent will be given the opportunity to pursue is expected to be comparable with that of other regulated monopoly utilities, such as electricity distribution (which in Ontario is regulated by the Ontario Energy Board).
Maintain Mapleton's borrowing capacity	To maintain Mapleton's existing municipal borrowing capacity for other municipal priorities over the long term and not to impair, reduce or otherwise affect Mapleton's municipal borrowing capacity in any way in connection with the Project.
Maintain public ownership of assets	To assure the residents of Mapleton that the existing infrastructure and New Infrastructure will remain at all times under public ownership by Mapleton during the 20 year term of the Project Documentation, and that Mapleton's Council, over the term, will continue to approve water and wastewater rates, development charges and other related tariffs.
Safe and reliable service	To provide for stable, long-term development and availability of safe and reliable water and wastewater service throughout the term of the Project Documentation compliant with all relevant legislative requirements.
Reduced environmental impact	To achieve efficiencies which may include reducing pollution, mitigating other adverse environmental impacts, realizing energy conservation related to the existing infrastructure and New Infrastructure.

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Competitive development charges[6]	Realize competitive development charges which may be associated with New Infrastructure.
Equal or better service levels	Achieve water system service levels that are at least comparable to and potentially greater than service quality and reliability levels currently enjoyed at this time.
Cooperative working relationship with Mapleton	Work cooperatively and productively with Mapleton's economic development department and planning department with respect to the deployment of New Infrastructure and operation of the water system generally.
Explore additional economic opportunities	Explore opportunities for additional investment or other economic benefits offered by Proponents (e.g. commitments for local employment and other investments within the Township of Mapleton, such as the location of administrative or other facilities and investment related to the Project, or other investment opportunities such as the expansion of natural gas services and/or introduction and expansion of fibre optic networks in the municipality.

The ensuing sections of this business case collectively examine all of Mapleton's objectives described above. This is achieved by having the following sections either explicitly or implicitly examine the following objectives (please note that the same objective can be examined in multiple sections):

Table 7: Examination of Mapleton's Objectives

Risk Analysis	Financial Impact on Ratepayers	Qualitative Analysis
Mapleton as regulator	Minimize taxpayer burden	Mapleton as regulator
Proponent to undertake delivery of New Infrastructure	Mitigate significant escalation of unplanned and unanticipated increases in rates	Reputable party
Minimize taxpayer burden	Capital structure	Proponent to undertake delivery of New Infrastructure
Mitigate significant escalation of unplanned and unanticipated increases in rates	Maintain Mapleton's borrowing capacity	Maintain public ownership of assets
Maintain public ownership of assets		Safe and reliable service
Safe and reliable service		Reduced environmental impact
Competitive development charges		Competitive development charges
Equal or better service levels		Equal or better service levels
		Cooperative working relationship with Mapleton
		Explore additional economic opportunities

[6] Please note that the Competitive Development Charges objective has been interpreted as relating to the efficiency of how infrastructure (including water and wastewater services) is delivered to new developments. Therefore, models that achieve this infrastructure delivery more efficiently and effectively better meet their criteria.

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3. Options Under Consideration

3.1 Description of Options

The Table below summarizes the three options under consideration that will serve as the basis for the ensuing analysis. To ensure a consistent understanding of these options, the definitions below have been reviewed and agreed to by representatives of Mapleton. All options involve Mapleton retaining ownership of the water and wastewater networks at all times. The traits of these models are potentially subject to change should Mapleton enter into Project Documentation with a Concessionaire (which could contain different roles and responsibilities):

Table 8: Options Under Consideration

Status Quo	Concession Model	Concession Model with CIB Financing
• Mapleton continues to provide public utility services for its water and wastewater infrastructure. • Mapleton finances capital expenditures through public debt issuances (all debt issued would count towards Mapleton's borrowing limit). Rates and/or development charges are adjusted in order to support repayment of these borrowings. • Mapleton procures design and construction contracts as required for capital expenditures (assumed to resemble Design-Bid-Build arrangements). • Mapleton undertakes operations and maintenance in-house or contracts out these services. • Mapleton assumes responsibility for billing and collection of rate revenue.	• Mapleton solicits proposals for water and wastewater services (under a Concession Model. • Agreement includes responsibility to design, build, finance, operate, and maintain both the existing networks and New Infrastructure. • Mapleton retains control of the rate-setting and rate-making functions. • Debt and equity is raised by the Concessionaire under a 60%/40% debt to equity ratio. Debt may be sourced from either private markets or on-balance sheet financing from the Concessionaire. • Project agreement assumed to contain detailed handback provisions. • Rate setting process would involve a Township committee that makes a recommendation to Council (who would then vote to approve/ disapprove rates the Concessionaire could charge to cover costs and generate the allowed return on equity). • Concessionaire would have the option of structuring their financial bid to include a lease of existing infrastructure or as a fixed term operating license (which could offer tax advantages). • Concessionaire has greater ability to take advantage of depreciation expensing throughout the concession	• Identical traits as the Concession Model except for the financing component. • While the financing structure remains a 60%/40% debt to equity ratio, the debt financing is sourced from the CIB at lower cost and with added flexibility than private market debt. • Equity continues to be provided by the Concessionaire.

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	term (which could offer tax planning benefits to ratepayers). • Concessionaire would be able to submit applications for rate revisions at pre-determined intervals (3, 5 or 10 years – to be confirmed). • Mapleton retains responsibility for billing and collection of rate revenue, with rate revenue then remitted to the Concessionaire.	

3.2 Global Precedents

There has not been a history of small municipally-owned water and wastewater systems entering into concession agreements in Canada. However, there are several precedent water and wastewater projects in other jurisdictions that possess some of these same traits. The chart below lists relevant projects that possess many of the same traits as the Concession Model being considered for Mapleton's water and wastewater network:

Table 9: Relevant Global Water and Wastewater Projects

Project	Location	Value	Delivery Model	New or Existing Asset	Term	Notes
City of Moncton Water Treatment Plant (1998)	Moncton, NB	$40M (total cost)	DBFO	New asset	20 years	• To address boil water advisories and poor water quality, the City of Moncton entered a P3 with Veolia for a new water treatment facility.[7] • Since entering the contract, the City has seen significant improvements in water quality while not leading to a loss in public control over the water network.[8]
Evan-Thomas Kananaskis (2014)	Kananaskis, AB	$37.5M (CAPEX)	DBFOM	Existing asset	10 years	• A consortium comprised of EPCOR, AECON, and Stantec delivered this project in order to upgrade the existing plant to increase capacity, achieve compliance with environmental standards, and replace aging infrastructure.[9] • EPCOR provided the financing on this project.[10] • The Government of Canada provided a grant of $9.95M towards the project.[11] • The project received the 2014 Award for Merit for Innovation and

[7] http://www.infrastructure.alberta.ca/documents/14-004_P3Leader_RPT_-_08_21_13.pdf
[8] http://www.infrastructure.alberta.ca/documents/14-004_P3Leader_RPT_-_08_21_13.pdf
[9] https://www.infrastructure.gc.ca/prog/fond-p3-canada-fund-eng.html#evan
[10] https://www.stantec.com/en/projects/canada-projects/e2/evan-thomas-water-and-wastewater-infrastructure-upgrades
[11] https://www.watercanada.net/alberta-goes-p3-route-for-kananaskis-treatment-project/

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						Excellence from the Canadian Council for Public-Private Partnership.[12]
Regina Water/ Wastewater Treatment Plant (2016)	Regina, SK	$158M (CAPEX)	DBFOM	Existing asset	30 years	• A consortium comprised of EPCOR, AECON, Graham, and Stantec delivered this water and wastewater project as part of upgrading/refurbishing the plant and increasing capacity.[13] • The City of Regina retained ownership over the plant, with customer issues handled by Service Regina.[14] • The capital cost of the project came in $6M under budget.[15]
Safe Clean Drinking Water Project (2016)	Saint John, NB	$216M (CAPEX)	DBFOM	New and existing asset	33 years	• A consortium comprised of Brookfield Financial, Acciona, North America Construction Ltd., AMEX, Dessau Inc., Simo Management, FCC Construction, and Guld Operators will deliver a new water treatment plant as well as 26 km of pipeline to renew the City's water transmission and distribution system.[16] • The City of Saint John will retain ownership and control of the assets and set water rates.[17] • The Government of Canada provided $57.3M towards the project.[18]
Lac La Biche Wastewater Treatment Plant (2013)	Lac La Biche, AB	$21M (CAPEX)	DBOM	New asset	N/A	• A consortium of Maple Reinders, Corix, and AECOM delivered a new wastewater treatment facility via a DBOM model.[19] • The Government of Canada provided $3.8M towards the project.[20]
Lions Gate Wastewater Treatment Plant (2017)	Vancouver, BC	$525M (CAPEX)	DBF	New asset	N/A	• A consortium comprised of Acciona, Dialog Design, Tetra Tech, Wood, and BTY Group are delivering a new water treatment plant to replace an

[12] https://www.newswire.ca/news-releases/albertas-evan-thomas-water--wastewater-treatment-project-wins-award-of-merit-at-17th-annual-ccppp-awards-for-innovation-and-excellence-in-p3s-516099981.html
[13] https://www.stantec.com/en/projects/canada-projects/r/regina-wastewater-treatment-plant-upgrade
[14] https://www.regina.ca/home-property/water/sewer/wastewater-treatment-plant/
[15] https://www.cbc.ca/news/canada/saskatchewan/cost-regina-wastewater-plan-175-million-1.3904245
[16] https://www.watercanada.net/saint-john-selects-preferred-proponent-for-water-p3/
[17] https://www.watercanada.net/saint-john-selects-preferred-proponent-for-water-p3/
[18] https://www.watercanada.net/saint-john-selects-preferred-proponent-for-water-p3/
[19] http://www.p3spectrum.ca/project/info/?id=186
[20] https://www.infrastructure.gc.ca/prog/fond-p3-canada-fund-eng.html#lac

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						existing one that has been in operation since 1961.[21] • The Government of Canada is contributing $212M towards the project.[22]
EPCOR USA Inc., State of Arizona (2011)	Arizona, USA	$440M USD (utility rate base)	Regulated Utility	Existing asset	Ongoing	• In 2011, EPCOR acquired Chaparral City Water Company in Arizona.[23] Since then, they have undertaken several tuck-in acquisitions under the banner EPCOR Water Arizona. • EPCOR now provides water and wastewater services to more than 211,000 customers in 31 communities and 9 counties in Arizona.[24] • The utility's capital structure is 57%/43% debt/equity with an approved return on equity of 9.7% (as of 2018).[25]
Thames Tideway Tunnel (2015)	London, UK	£4.2B (CAPEX)	Regulated Utility	New asset	125 years	• The Thames Tideway Tunnel project involves the construction of a new sewage and storm water network in London, UK.[26] • A consortium of Allianz Capital Partners, Amber Infrastructure Group, Dalmore, DIF, International Public Partnerships, and Swiss Life was selected to deliver the project.[27] • The project has attracted significant attention due to its use of a regulated asset base model, which is intended to offer pricing certainty to both the private sector developer/ operator and customers.[28] • The debt/equity ratio of the project is 60%/40%.[29]
Mundaring Water Treatment Plant (2009)	Mundaring, Australia	$300M AU (CAPEX)	DBFOM	New asset	37 years	• A consortium comprised of Acciona, Brookfield, RBS, and Trility will build a new water treatment plant, a pumping station, various transmission pipelines and integration works.[30] • The plant will serve as a major source of water for a rural area that

[21] https://www.inframationnews.com/deals/1340777/lions-gate-wastewater-treatment-plant-p3.thtml
[22] https://www.acciona.ca/pressroom/news/2017/april/acciona-to-build-new-cad-dollar-525-million-waste-water-treatment-plant-in-vancouver/
[23] https://www.newswire.ca/news-releases/epcor-acquires-arizona-water-provider-for-35-million-us-544199642.html
[24] https://www.epcor.com/about/Documents/epcor-investor-presentation-may-2018.pdf
[25] https://www.epcor.com/about/Documents/epcor-investor-presentation-may-2018.pdf
[26] https://www.inframationnews.com/deals/997663/thames-tideway-tunnel-ttt-project.thtml
[27] https://www.inframationnews.com/deals/997663/thames-tideway-tunnel-ttt-project.thtml
[28] https://www.linklaters.com/en/insights/publications/allens-insights/2017/a-model-project-the-thames-tideway-tunnel-and-the-regulated-asset-base-model
[29] https://www.inframationnews.com/deals/997663/thames-tideway-tunnel-ttt-project.thtml
[30] https://www.inframationnews.com/deals/748893/mundaring-water-treatment-plant.thtml

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						includes a significant agricultural element.[31]

Based on the findings above, the key traits of the Concession Model have been used in several projects in other jurisdictions:

Table 10: Relevant Global Water and Wastewater Projects – Summary of Key Traits

Project	Design	Build	Finance	Operate	Maintain	Return on regulated asset base
City of Moncton Water Treatment Plant	✓	✓	✓	✓		
Evan-Thomas Kananaskis	✓	✓	✓	✓	✓	
Regina Water/ Wastewater Treatment Plant	✓	✓	✓	✓	✓	
Safe Clean Drinking Water Project	✓	✓	✓	✓	✓	
Lions Gate Wastewater Treatment Plant	✓	✓	✓			
Lac La Biche Wastewater Treatment Plant	✓	✓		✓	✓	
EPCOR USA Inc., State of Arizona	✓	✓	✓	✓	✓	✓
Thames Tideway Tunnel	✓	✓	✓	✓	✓	✓
Mundaring Water Treatment Plant	✓	✓	✓	✓	✓	

[31] https://www.acciona.ca/projects/water/drinking-water-treatment-plants/mundaring-dwtp/

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4. Risk Analysis

4.1 Methodology

PwC conducted a risk analysis with Mapleton to identify the Project's risk-adjusted whole-of-life costs and the expected retained risk by the Township under the three delivery models. This involved identifying, defining, and quantifying a list of 22 risks associated with the project. The risk analysis was limited to these 22 risks due to the time constraints to complete the business case before RFP issuance.

Prior to the workshop, PwC used knowledge derived from previous water and wastewater projects to pre-populate the risk register with probability, impact, and allocation figures for each risk in order to facilitate a productive, concise discussion. Representatives of Mapleton and PwC then discussed the estimations of the probability and impact of each risk as well as their allocation based on their experience in the water and wastewater sector and the experience of Mapleton representatives with capital project delivery and the specific requirements of this project. Mapleton then agreed to figures for each risk, which served as the basis for PwC's quantification of risks.

4.2 Retained Risk Values

The risk analysis produced results demonstrating that the Status Quo entails significantly more retained risk for Mapleton than either the Concession Model or Concession Model with CIB Financing. Results are shown in net present value ("NPV") in Table 11.

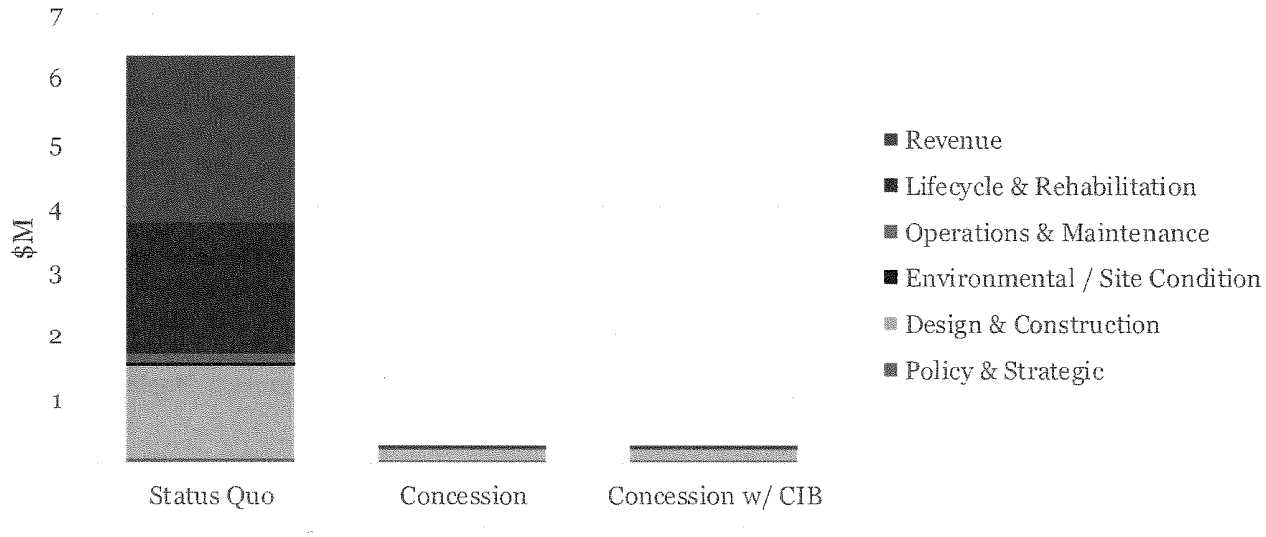
Table 11: Retained Risk Values (NPV)

Cost Base ($NPV)	Status Quo	Concession Model	Concession Model with CIB Financing
Policy & Strategic	$58,033	$24,456	$23,484
Design & Construction	$1,443,360	$157,961	$157,961
Environmental / Site	$64,020	-	-
Operations & Maintenance	$117,443	$35,785	$35,785
Lifecycle & Rehabilitation	$2,061,284	$23,625	$23,625
Revenue	$2,602,412	$14,852	$14,852
Total	**$6,346,552**	**$256,679**	**$255,707**

The figure below graphically offers a comparison of retained risk for each of the delivery options.

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Figure 5: Retained Risk Graph (NPV)



4.1 Top Risks Under Each Model

The chart below lists the top 5 risks under each delivery model:

Table 12: Top Risks Under Each Delivery Model (NPV)

Rank	Status Quo		Concession Model & Concession Model with CIB Financing	
1	Rate setting process	$2,210,792	Higher than expected construction costs (including inflation risk)	$100,983
2	Asset residual	$1,507,939	Scope changes (during construction)	$36,647
3	Higher than expected construction costs (including inflation risk)	$775,511	Higher than expected operating costs (including inflation risk)	$35,637
4	Rehabilitation works	$498,482	Latent defects on existing assets	$15,816
5	Significant escalation of unplanned and unanticipated increases in rates	$388,636	Regulatory approvals for design and construction activities	$12,335

The Status Quo entails substantially more retained risk for Mapleton than the other two models in large part due to higher probabilities, impacts, and allocation to Mapleton when it comes to the rate setting process (i.e., rates not covering costs), the residual value of the networks at the end of the concession term, higher than expected construction and rehabilitation costs, and significant escalation of unplanned and unanticipated increases in rates due to future CAPEX spending.

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By contrast, the Concession Model and Concession Model with CIB Financing reduce these risks through private sector incentives to minimize costs (including the risk Mapleton – as regulator – declines to approve requested cost increases) and drawing on their technical, operational, and financial expertise in delivering water and wastewater networks.

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5. Financial Impact on Ratepayers

5.1 Overview and Methodology

PwC conducted a financial analysis of the impact on ratepayers if Mapleton were to deliver its water and wastewater networks under the Status Quo model, Concession Model, or Concession Model with CIB Financing.

Rates for each of Mapleton's water and wastewater networks fall into two categories: (1) base rates; and (2) consumptive rates. Base rates are charged regardless of consumption of water and wastewater services by consumers. By contrast, consumptive rates vary by consumption. Within consumptive rates, there are two blocks of consumers: Block 1 and Block 2. Block 1 relates to bi-monthly consumption up to and including 34 m^3, with Block 2 relating to bi-monthly consumption above 34 m^3.

PwC's analysis held base rates constant (save annual increases in the number of consumers), drawing on projected figures developed by Watson & Associates. PwC instead focused on calibrating the consumptive rates for Block 1 and Block 2 (for each of the water and wastewater networks) based on the annual consumption forecasts provided by Watson & Associates. Per instructions from Mapleton, PwC assumed development charges would be used to help fund the water and wastewater networks, thereby reducing the rates charged to consumers in order to cover costs. PwC then calculated the consumptive rates needed to cover costs under each delivery model, given the different financing structures of each. Under the concession models, this includes the rate revenue required to return all capital invested by the Concessionaire to develop New Infrastructure. This includes a reserve that helps ensure Mapleton has accumulated the funds needed to return capital invested by the Concessionaire in New Infrastructure at the end of the concession term, thus avoiding the need to increase taxes to cover costs related to the networks. Any cost differences between models will be reflected in the consumptive rates comparison.

5.2 Key Assumptions

The cost assumptions, projections around the number of consumers, and consumption projections for the water and wastewater networks were provided by Watson & Associates[32] Economists Ltd. The source and interpretation of key assumptions for the financial analysis PwC conducted is described below:

- PwC received the latest consumption readings for Drayton (up to October 2018) and Moorefield (up to September 2018). The calculated annual consumption was based on the latest 12-months of billing data available;
- Consumption figures were used to calculate a total estimated annual consumption by block for all meter sizes in the water and wastewater networks;
- The number of metered customers, broken down by meter size, was compiled from the latest billing data provided by the Township;
- In the intervening years since the 2017 report, the expected growth in customers has not been realized. Discussions with Township staff indicated growth in Drayton and Moorefield has lagged due to capacity constraints in the Wastewater System. However, Township staff have indicated that these constraints have been remedied and that growth targets to 2024 should be maintained from the 2017 report. Therefore, the forecasted annual growth in customers has been increased relative to the 2017 report in order to reach targeted customer counts by year-end 2024; and
- Watson & Associates developed two rate scenarios for the water and wastewater networks:
    - Scenario 1: Development Charge Funding Available – Maintains the Township's declining block rate structure currently in use, and includes development charges as a funding source for growth-related capital needs over the forecast period; and
    - Scenario 2: Development Charge Funding Not Available – Maintains the Township's declining block rate structure currently in use, but does not include development charges as a funding source for growth-related capital needs.

[32] Water & Wastewater Rate Update ("Watson Report"), prepared by Watson & Associates[32] Economists Ltd. on May 31, 2019 and subsequently updated on June 17, 2019

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Cost assumptions sourced from the Watson Report include:

- Capital expenditures for water and wastewater including recurring lifecycle/rehabilitation and growth related major projects; and
- Operating costs for water and wastewater including operating, materials, supplies, services, rents, testing, and maintenance.

PwC took a conservative approach to estimating costs by assuming them to be the same regardless of delivery model. However, PwC recognizes that:

- The breakdown within operating costs may vary by proponent or delivery model; and
- Efficiencies – as reflected in lower capital or operating costs – may be realized by proponents under either concession model as compared with the Status Quo.

Despite this, insufficient information was available to estimate the quantum of efficiencies with any degree of confidence; therefore, the aforementioned conservative approach (i.e., holding costs constant under all delivery models) was adopted.

With respect to financing assumptions under the Concession Model, few precedents exist for project financings of water and wastewater projects the size of Mapleton's. Therefore, it was assumed that the Concession Model would see debt provided from the Concessionaire's balance sheet consistent with the corporate debt rates of utilities. The figures used do not take account of any risk premium or transaction costs that may be added to these rates, or potential differences in borrowing rates amongst private parties of different size and creditworthiness.

While PwC was provided operating and capital (i.e., lifecycle and rehabilitation only) budget estimates for 10 years, these figures were extrapolated for an additional 10 years to match the assumed 20 year term of the concession.

Under the Status Quo, it was assumed that capital and lifecycle expenditures are funded 50% through increases to rates in the year of expenditure and 50% through Mapleton issuing debt that is repaid through higher rates over time to cover debt services costs (i.e., principal and interest).

Per Mapleton's direction, under the concession models, it was assumed the Concessionaire would be able to access Mapleton's existing water and wastewater reserve fund in order to smooth rate increases; however, at the time this business case was published, the exact amount and timing of any reserves that will be available remains to be determined by Mapleton.

Revenue and consumption assumptions sourced from the Watson Report include:

- Development charges are included as per "Scenario 1: Development Charge Funding Available" cash flows. The assumptions are sourced directly from the Watson Report and escalate annually.
- Base Charges are included as per the Watson Report and escalate annually based on expected increase in users. The underlying rates are not changed for this analysis.
- Water consumption and wastewater flows for Block 1 (up to and including 34 m^3) and Block 2 (over 34 m^3) are sourced from the Watson Report and escalate over time based on expected increase in users.

Please refer to the table below for a list of the key assumptions in the financial model (non-exhaustive list).

Table 13: Key Financial Modelling Assumptions

Assumption	Status Quo	Concession Model	Concession Model with CIB Financing	Source
Model start date	January 1, 2020	January 1, 2020	January 1, 2020	• Watson & Associates rate study (June 17, 2019)
Model end date	December 31, 2039	December 31, 2039	December 31, 2039	• CIB term sheet

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Financing draw period	5 years	5 years	[redacted] years	• CIB term sheet
Discount rate	4.00%	4.00%	4.00%	• PwC assumption
Gearing (debt/equity)	100%/0%	60%/40%	60%/40%	• Mapleton water/wastewater RFQ; CIB term sheet
Upfront fees for short term debt	0.00%	1.10%	[redacted]%	• Precedent P3 projects in the utility /energy sector
Commitment fees for short term debt	0.00%	0.33%	[redacted]%	• Precedent P3 projects in the utility/energy sector
Short term debt rate	4.00%[33]	4.00%	[redacted]%	• Watson & Associates rate study (June 17, 2019) used instead of current Mapleton cost of debt (3.43%) per Mapleton guidance • Industry investor presentation from a major utility • CIB term sheet
Long term debt rate	4.00%[34]	4.00%	[redacted]%	• Watson & Associates rate study (June 17, 2019) used instead of current Mapleton cost of debt (3.43%) per Mapleton guidance • Industry investor presentation from a major utility • CIB term sheet
Minimum DSCR	N/A	1.20x	[redacted]x	• CIB term sheet
Target equity IRR	N/A	8.50%	[redacted]%	• Industry investor presentation from a major utility
Operating cost mark-up	0.00%	0.00%	0.00%	• PwC assumption (to be confirmed)
Block 2 rate multiplier	0.80	0.80	0.80	• Watson & Associates rate study (June 17, 2019)

5.3 Financial Model

The financial model assumes that all capital expenditures and all lifecycle costs are financed during a [redacted] draw period, with the total timeframe of analysis extending to 20 years. The [redacted] draw period is based on an assumption provided by the CIB. All capital and lifecycle expenditures during the [redacted] draw period are financed at a 60%/40% debt/equity ratio for both concession models. The Status Quo model funds 50% of capital and lifecycle expenditures directly through rate revenue in a given year, resulting in significant rate spikes for any year with a large capital expenditure. The remaining 50% of capital and lifecycle costs under the Status Quo are funded through Mapleton

[33] Per Mapleton guidance.
[34] Per Mapleton guidance.

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issuing debt that is repaid through higher rates over time to cover debt services costs (i.e., principal and interest). The 60%/40% debt/equity ratio was provided by Mapleton and is comparable with the capital structure of other regulated utilities (e.g., Ontario's local distribution company sector). This capital structure is also comparable to what seen in other water and wastewater projects, as described in the "Global Precedents" section above.

The Status Quo model assumes public financing through debenture issuances at a rate of 4.00%, as per the Watson Report assumptions received by email on June 17, 2019. The Concession Model debt rate of 4.00% is based on public information for a debt issuance of a water/wastewater industry player. The CIB term sheet outlines a [redacted]. The [redacted]% target equity return is based on an industry investor presentation from a major utility with extensive experience in the water/wastewater sector.

The financial model calculates short term interest for capital expenditures in the year they are incurred, and then those investments are immediately amortized for the remainder of the 20 year timeframe of analysis. For example, a cost incurred in year 3 begins to amortize the next year for the remaining 17 years. Principal on both debt and equity is fully repaid at the conclusion of the 20 year timeframe of analysis. The equity return is modelled based on an amortizing profile for the interest component of an [redacted]% return rate.

Lifecycle costs incurred after the [redacted] draw period are modelled on a pass through basis, with no markup for profit. The assumption is that a Concessionaire would seek to earn their return purely through the equity return component of capital and lifecycle expenditures during the [redacted] draw period. Operating costs are also modelled entirely on a pass through basis, with no markup or profit. Please note that the assumption to model these costs on a pass through basis was made despite OCWA being assumed to generate a profit when performing these services; however, since OCWA's profit margin and the desired profit margins of other bidders are unknown, it was assumed these costs will be delivered on a pass through basis in order to allow for a like-for-like comparison between models. This is consistent with our understanding of the practices regarding operating costs in other regulated utilities.

5.4 Water Rates

The figures below illustrate Mapleton's projected consumptive water rates for Blocks 1 and Block 2 (the latter of which is set at 80% of Block 1 rates, per guidance from Mapleton and Watson & Associates). There are significant spikes to consumptive rates under the Status Quo model due to 50% of capital and lifecycle costs funded via rate increases in the year of expenditure. The rates for concession models have been sculpted to minimize rates and the cash reserve at the end of the 20 year concession term. Please note that the magnitude of the increase for the Status Quo model causes the graphs below to have a scale such that it is difficult to distinguish between the lines intended to denote the Concession Model vs. Concession Model with CIB Financing below; however, it is worth noting that the Concession Model with CIB Financing offers lower rates than the Concession Model.

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Figure 6: Water Rates – Block 1 Consumptive Rates

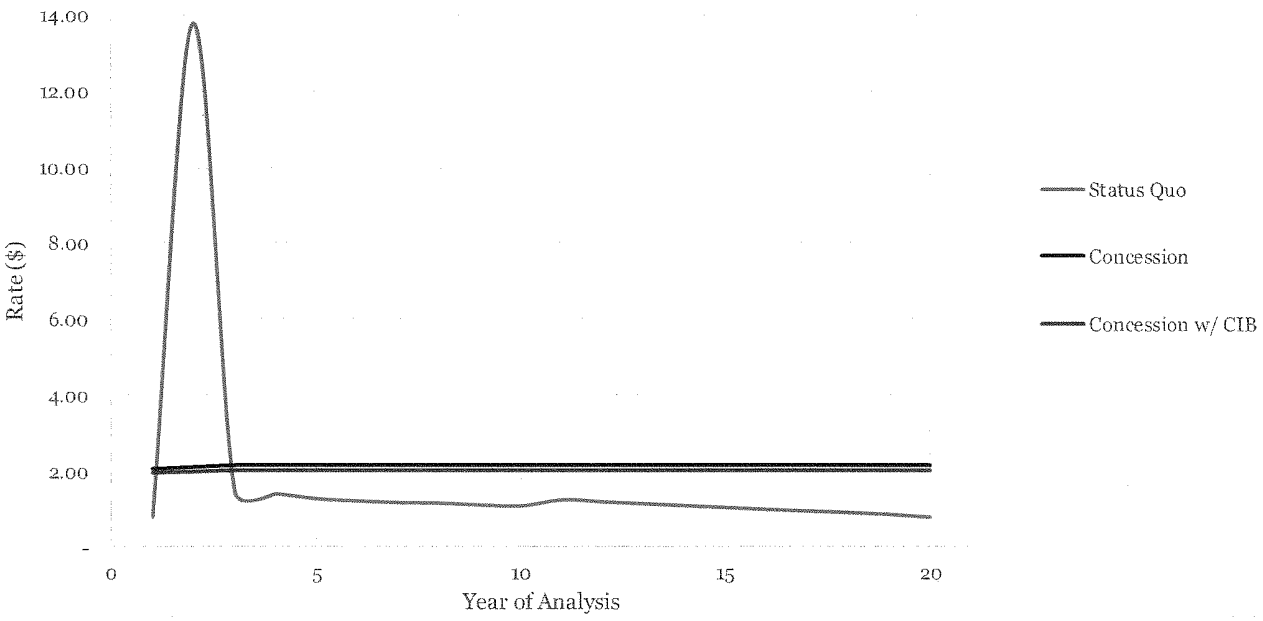
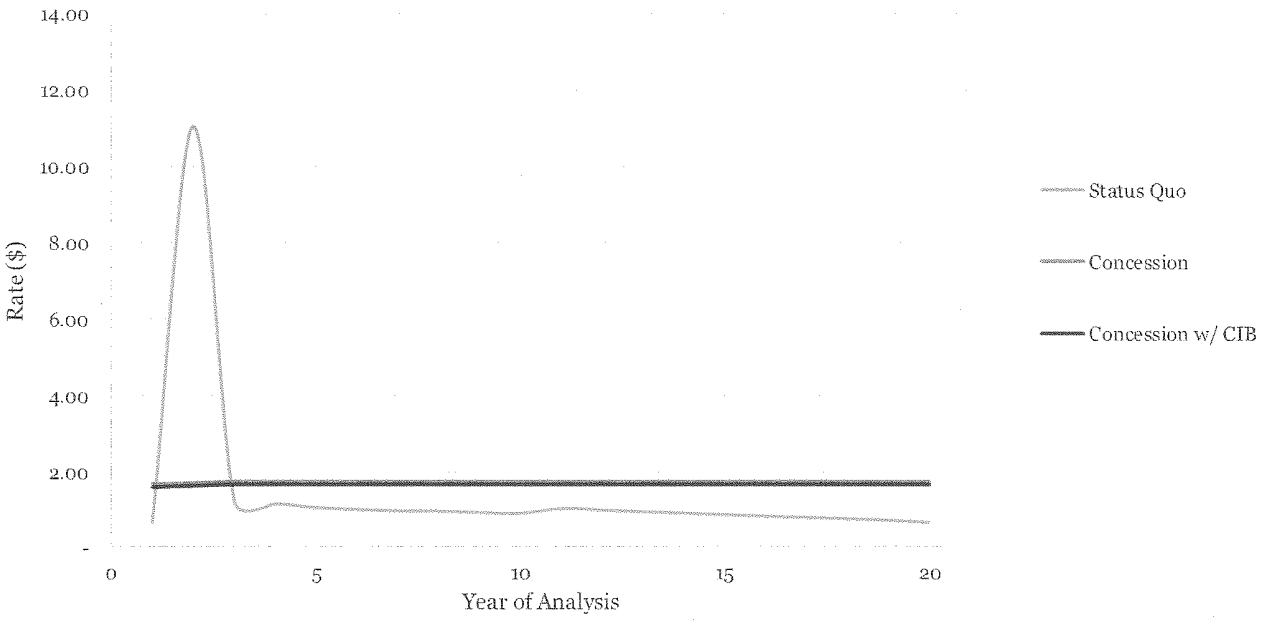


Figure 7: Water Rates – Block 2 Consumptive Rates



5.5 Wastewater Rates

As with the water rates above, the figures below illustrate Mapleton's projected consumptive wastewater rates for Blocks 1 and Block 2 (the latter of which is set at 80% of Block 1 rates, per guidance from Mapleton and Watson & Associates). There are significant spikes to consumptive rates under the Status Quo model due to 50% of capital and lifecycle costs

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funded via rate increases in the year of expenditure. The rates for the Concession Model and the Concession Model with CIB Financing have been sculpted to minimize rates and the cash reserve at the end of the 20 year term.

Figure 8: Wastewater Rates – Block 1 Consumptive Rates

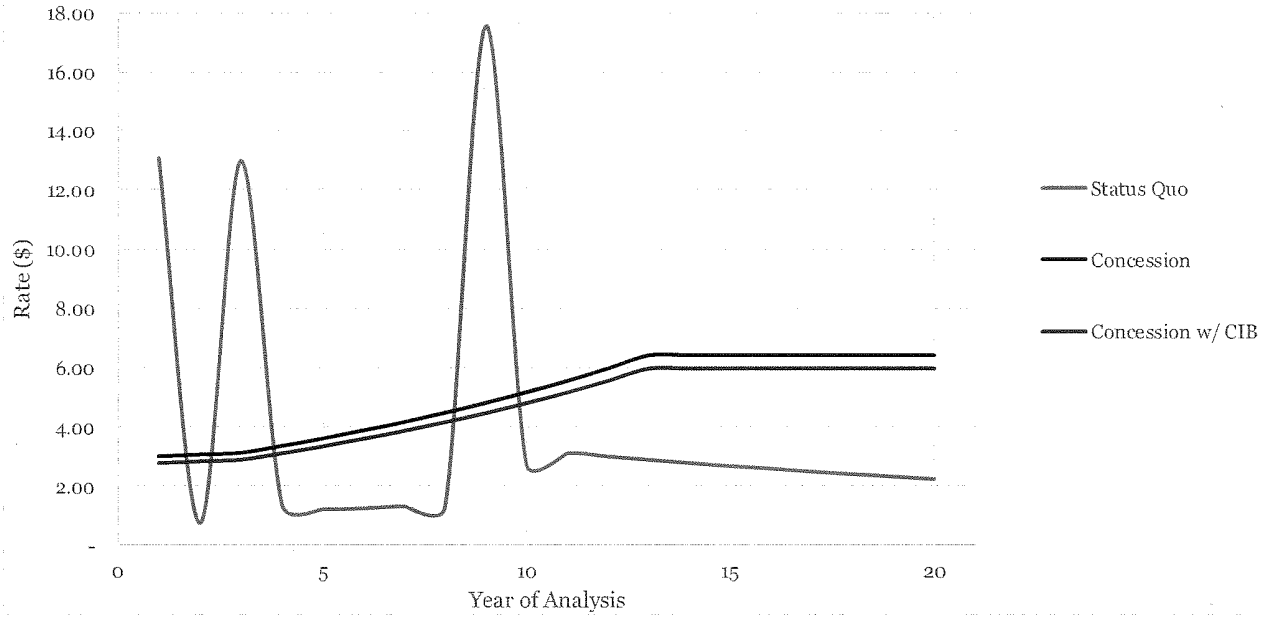
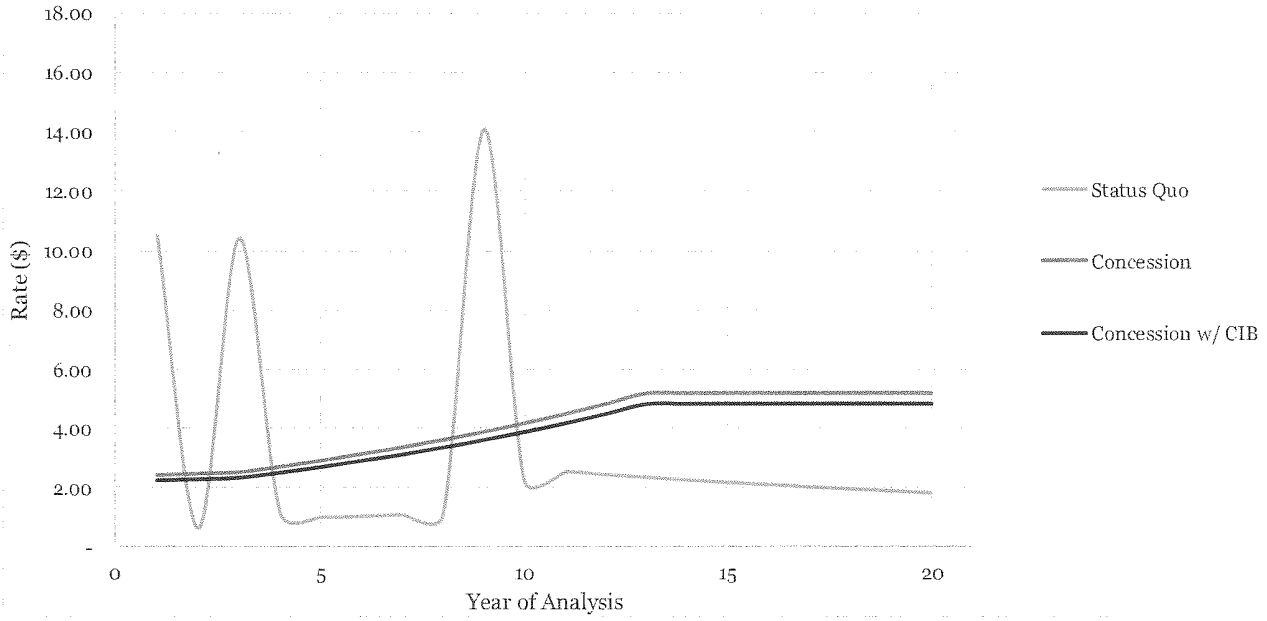


Figure 9: Wastewater Rates – Block 2 Consumptive Rates

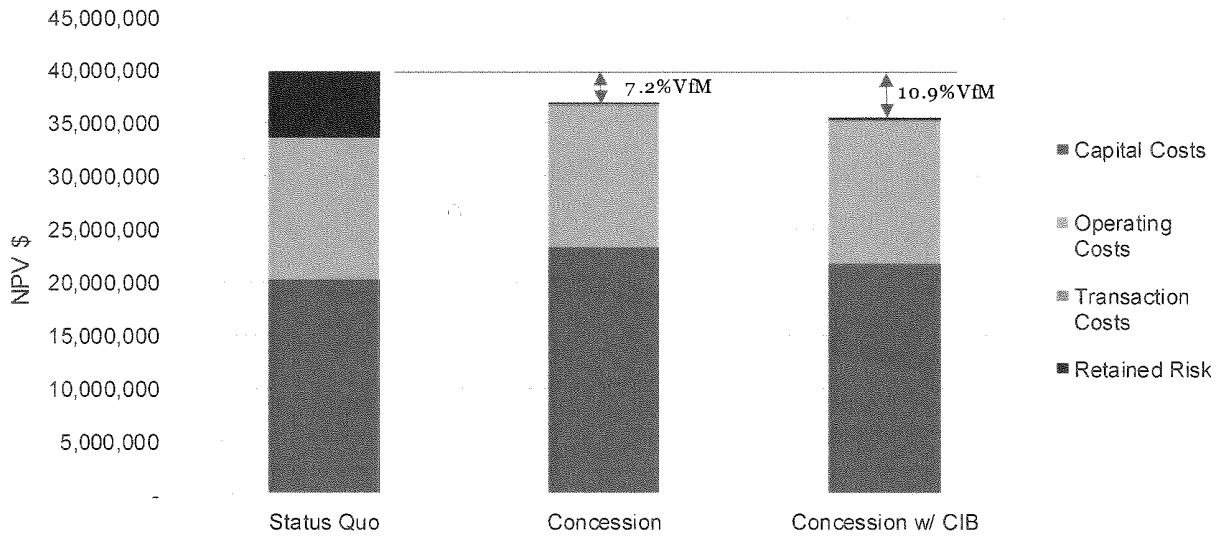


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5.6 Value for Money

While the water and wastewater rates above (which are on a cash basis) are helpful to illustrate the projected impact to consumers, they fail to fully capture the benefits and costs of each delivery model. The chart below offers such a comparison by adding together projected capital costs, operating costs, transaction costs, and retained risk (by Mapleton) for each of the three models.

Figure 10: Mapleton – Value for Money Comparison (Risk-Adjusted NPV Basis)



This analysis generates the following conclusions:

- The Concession Model with CIB Financing generates the lowest risk-adjusted NPV of all models, or 10.9% savings as compared with the Status Quo model. This is due to Mapleton retaining substantially less risk under this model compared with the Status Quo and the CIB Financing reducing financing costs as compared with the Concession Model;
- The Concession Model also offers a lower risk-adjusted NPV as compared with the Status Quo, generating 7.2% savings. Similar to the Concession Model with CIB Financing, these savings are driven by Mapleton retaining less risk under this model compared with the Status Quo; however, higher financing cost assumptions due to a lack of CIB Financing lead to less savings than the Concession Model with CIB Financing; and
- The Status Quo model has the highest risk-adjusted NPV due to the substantial amount of risk Mapleton would retain.

5.7 Implications

The implications of PwC's financial analysis of the different delivery models are as follows:

- On a cash flow basis, the Status Quo model results in large spikes to rates as a result of funding 50% of capital and lifecycle expenditures directly through rate revenue in a given year (with the remaining 50% funded via debt issuance that requires future ratepayers to repay debt service costs via higher rates).
- Any potential efficiencies related to capital and operating spending that could be brought by the private sector have not been considered in this analysis due to the uncertainty around the amount and timing of any potential savings;
- Comparing models on only a cash flow basis fails to fully capture the benefits and costs associated with each of the delivery models. In particular, including the results of the risk analysis allows for the delivery models to be

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compared on a risk-adjusted NPV basis to allow for a full comparison of all expected project costs on a value for money basis;

- A risk-adjusted NPV comparison of models shows that the Concession Model with CIB Financing produces the best value for money. This is largely due to:
    - The Status Quo model seeing Mapleton retain significant risk related to the rate setting process;
    - Residual asset value;
    - Higher than expected construction and rehabilitation costs;
    - Significant escalation of unplanned and unanticipated increases in rates;
    - Effect of private sector incentives minimizing the cost of risk under the Concession Model with CIB Financing model; and
    - The lower cost of financing under this model as compared with the Concession Model.
- The structure of the CIB Financing (based on the terms current to the publishing of this business case) would offer the Concessionaire considerable flexibility to draw on debt as needed. This would help address the uneven capital spending schedule Mapleton has developed for New Infrastructure, which would otherwise require significant debt issuance from the Town and/or significant escalation of unplanned and unanticipated increases in rates in the years where investments are made; and
- The ability of a Concessionaire to take advantage of depreciation offers an advantage over the Status Quo, as it will allow for the funding of the reserve fund.

5.8 Rent Payments from the Concessionaire

Both the Concession Model and Concession Model with CIB Financing would see the Concessionaire have the option of structuring their financial bid to include a lease or fixed term operating license of existing infrastructure (since Mapleton would retain ownership of all water and wastewater assets). BLG believes this could allow the Concessionaire to claim these rent payments to Mapleton as a deductible expense for tax purposes. By doing so, the Concessionaire could be able to reduce the rate revenue required from consumers to cover capital and operating costs and generate a return.

At present, it is unclear whether Prequalified Parties would propose including such rent payments as part of their bid at the RFP stage; therefore, PwC's financial analysis has focused only on required rate revenue. However, should Prequalified Parties take advantage of this, it could reduce the required rate revenue from consumers. By contrast, the Status Quo model does not offer this opportunity as there would be no party to lease the existing infrastructure from Mapleton and thus potentially claim a tax deduction.

5.9 Tax Implications of Depreciation

Under the proposed RFP process, bidders may choose to structure the financial portion of their bid in different ways. This could include different structures related to a Concessionaire's ability to depreciated assets, which could generate tax savings that lowers required rate revenue. For example, bidders could conceivably build depreciation into lower ongoing required rate revenue, provide an upfront payment to Mapleton equal to the tax benefits of depreciation, or accept a lower return on equity due to these tax benefits. Given the difficulty ascertaining which of these (or other) structures bidders might use, the financial model has not attempted to calculate these tax savings and instead focuses on the required rate revenue stemming from the networks' expected capital and operating needs. This approach was adopted to offer a conservative view of the required rate revenue under each model; therefore, bids received through the RFP process could produce lower rates than those projected in the financial model.

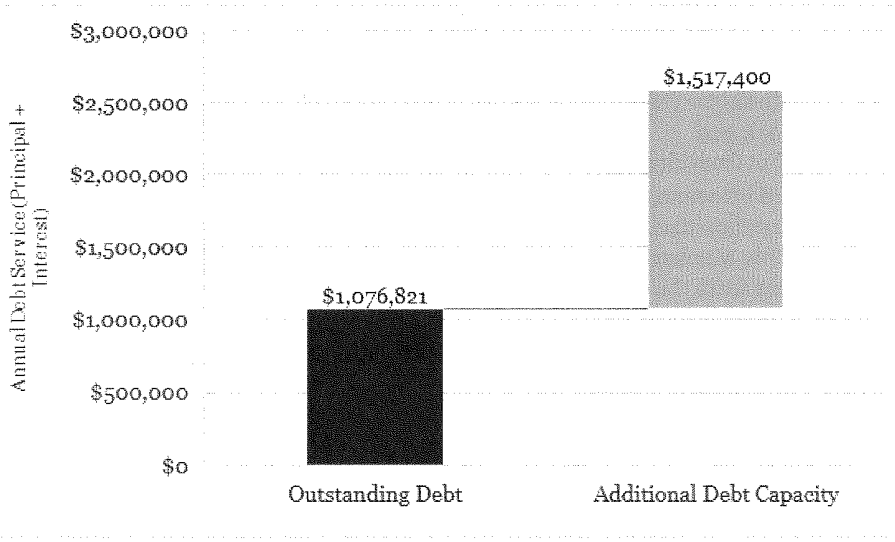
5.10 Borrowing Capacity Limit

An important consideration related to the financial impact of the different options under consideration is their respective impacts on Mapleton's borrowing capacity limit, which is calculated based on an annual debt service limit. Under provincial legislation, Mapleton's annual debt service limit (including both principal and interest payments) is equal to 25% of net municipal revenues (excluding grants from the Province of Ontario or Government of Canada or

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other revenues from other municipalities).[35] As of 2018, the Township's annual debt service limit totaled $2,594,222 of which $1,076,821 (or ~41.5%) was already used for debt service charges on outstanding debt.[36] This leaves $1,517,400 in additional debt service capacity for the Township on an annual basis.[37]

Figure 11: Mapleton – Additional Borrowing Capacity (Annual Basis)



Mapleton estimates that the $1,517,400 in additional annual debt capacity would allow the Township to issue $18,000,000 in new debt (principal basis) before hitting their debt limit.[38] This would come on top of the $9,302,041 of principal the Township currently has outstanding.[39] This assumes their current weighted average interest rate of 3.43% remains unchanged on a 20-year debenture.[40]

Watson & Associates estimates Mapleton would need to issue ~$15,550,000 in additional debt by 2028 to finance 100% of the anticipated CAPEX for water and wastewater; therefore, this debt would consume ~86.4% of the Township's additional debt capacity, or more than double the amount of debt Mapleton has issued for all services. [41] The corollary is that having Mapleton finance these investments would significantly limit their ability to fund municipal services aside from water and wastewater services as the Township would have only $2,450,000 in borrowing capacity remaining.

[35] Per June 14, 2019 guidance from the Township of Mapleton.
[36] Per June 14, 2019 guidance from the Township of Mapleton.
[37] Per June 14, 2019 guidance from the Township of Mapleton.
[38] Per June 14, 2019 guidance from the Township of Mapleton.
[39] Per June 14, 2019 guidance from the Township of Mapleton.
[40] Per June 14, 2019 guidance from the Township of Mapleton.
[41] Per June 17, 2019 update to Watson & Associates rate study.

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Figure 12: Water/Wastewater CAPEX as % of Total Mapleton Debt Capacity

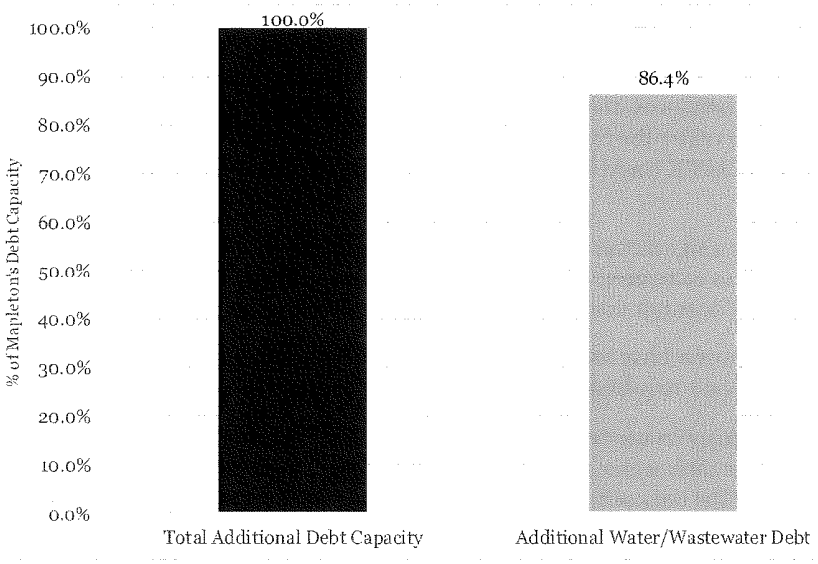
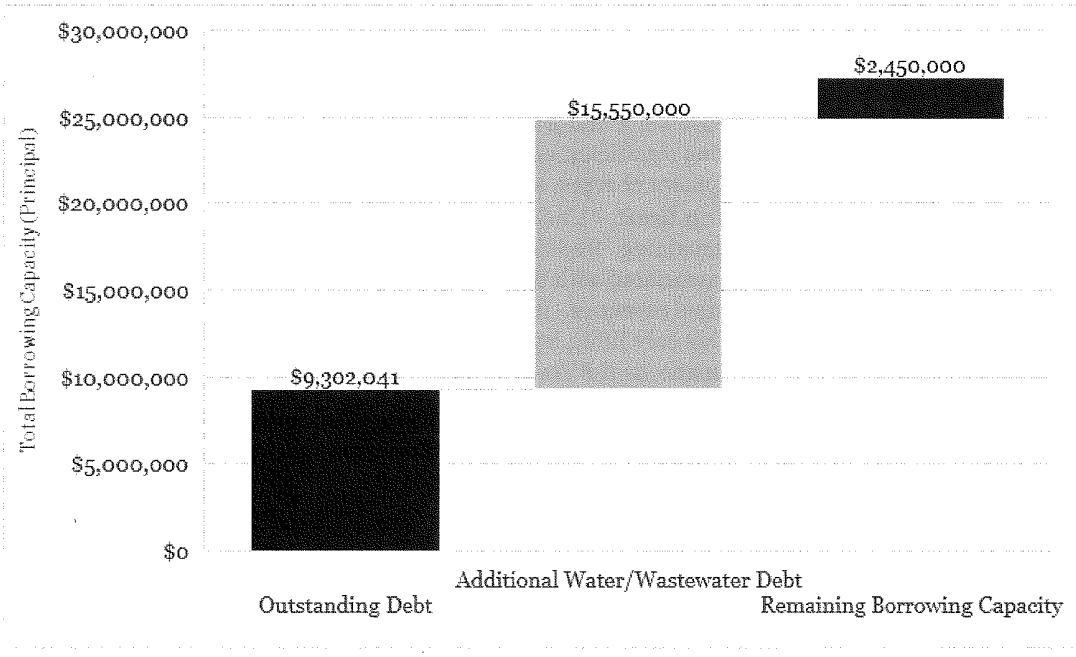


Figure 13: Remaining Borrowing Capacity Under Status Quo Model



Assuming an exemption to the provincially-imposed debt limit is not possible, water and wastewater services would place a significant strain on Mapleton's finances if the Township were to finance these capital investments themselves. Moreover, this financial stress would be exacerbated if any of the following financial risks materialized:

- ***Net municipal revenue does not materialize as expected*** – If Mapleton's net municipal revenue comes in below estimates (e.g., due to lower than expected tax revenue), the Township's debt limit would be reduced. This would further reduce Mapleton's maximum borrowing capacity and place further strain on their ability to finance the needed water and wastewater CAPEX under the Status Quo model;
- ***CAPEX costs go over budget*** – Under the Status Quo model, if planned water and wastewater CAPEX comes in over budget, Mapleton would have to either increase rates, development charges, and/or taxes, or issue

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additional debt to finance the higher costs. Alternatively, if water and wastewater CAPEX came in ~15.8% over budget under the Status Quo model, the remainder of Mapleton's borrowing capacity would be consumed; or

- ***Interest rates increase*** – An increase in Mapleton's interest rates from the current level of 3.43% (e.g., to Mapleton's estimate of a long-term rate of 4.00% per guidance from the Township) would increase the interest expense on future debt issuances, thereby reducing the Township's borrowing capacity. Such an increase in interest rates is possible under the Status Quo model, as the additional debt Mapleton would take on to finance water and wastewater CAPEX could lead to borrowers demanding a higher interest rate on the Township's future debt issuances.

Mapleton's debt limit highlights a significant limitation of the Status Quo model as it would significantly erode the Township's borrowing capacity as compared with the other two models. This is due to the other models involving the issuance of third party debt that does not count towards Mapleton's borrowing limit.

Under the Status Quo model, approaching the Township's borrowing limit could result in some combination of the following (depending on Mapleton's required future investments and state of assets):

- ***Reductions to or delays in water and wastewater CAPEX*** – Mapleton could be forced to reduce or delay planned CAPEX in their water and wastewater network. Depending on which investments are reduced or delayed and the state of the network, this could impact water and wastewater service levels for users;
- ***Reductions to or delays in other municipal services*** – The Township could be forced to reduce or delay planned investments in other municipal services (e.g., policing, roads, waste management, fire services, parks and recreation, etc.) which could impact service levels for constituents depending on the state of these services and required future investments (please note that an analysis of investments required for other municipal services is beyond the scope of PwC's analysis);
- ***Increased rates, development charges, and/or taxes*** – Approaching the Township's borrowing limit could also lead to immediate increases in funding tools like water and wastewater rates, development charges, and/or other municipal taxes to pay for water and wastewater CAPEX. This would run counter to Mapleton's stated objectives, including minimizing significant escalation of unplanned and unanticipated increases in rates and maintaining competitive development charges; and
- ***Exceeding Mapleton's borrowing limit*** – Under the Status Quo, the Township would only have $2,450,000 in borrowing capacity remaining. Should tax revenue fail to materialize as expected, Mapleton could see a scenario where the debt associated with the water and wastewater networks sees the Township exceed the limit of 25% of net municipal revenues. It is beyond PwC's scope to determine the exact legal and financial implications of exceeding this debt limit; however, it seems reasonable to assume that any such implications would be highly problematic for the Township.

Therefore, unless Mapleton is willing and able to make a long-term budgetary commitment to using their remaining borrowing capacity to finance its water and wastewater network, the Township's debt limit poses significant challenges for the viability of the Status Quo model given the CAPEX requirements.

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6. Qualitative Analysis

6.1 Methodology

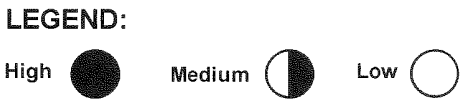
It is important to also consider the potential qualitative benefits associated with the different options under consideration. This section analyzes each option by examining how well it meets Mapleton's stated objectives from the RFQ. This includes:

- Assigning each option a rating on each objective (as defined in the "Project Objectives" section of this document); and
- Offering a rationale for that rating.

Ratings use the following scale:

- ***High*** – Fully or almost fully achieves Mapleton's objective;
- ***Medium*** – Partially achieves Mapleton's objective; and
- ***Low*** – Does not achieve Mapleton's objective.

Ratings will be illustrated using the graphics below:



6.2 Status Quo

The table below sets out the ratings and associated rationale for the Status Quo model against each of Mapleton's stated objectives for the Project:

Table 14: Status Quo – Qualitative Analysis

Objective	Rating	Rationale
Mapleton as regulator	●	Mapleton retains its role as regulator, including the rate-setting and rate-making functions. Rates would be determined based on OPEX and CAPEX projections for the existing and expanded networks.
Reputable party	●	Mapleton will retain responsibility for design and construction contracts. These contracts will presumably be awarded to reputable contractors with extensive experience in capital project and water and wastewater delivery. Operations will continue to be performed by the Ontario Clean Water Authority (OCWA), which has a long track record of operating water and wastewater infrastructure including Mapleton's existing network.
Financial, technical, and operational expertise and capacity to deliver project	○	Mapleton has limited internal resources and capacity (from a financial and technical standpoint) to oversee its existing networks and manage the development of new infrastructure. For example, at present, only ~1 FTE is allocated to managing the network, with no plans to change this going forward. While Mapleton's internal public works staff have experience in the water and wastewater sector and with capital project delivery, they have numerous responsibilities (including other assets like roads, buildings, etc.) that mean they lack the capacity to effectively manage the existing and expanded water and wastewater networks going forward.
Maintain public ownership of assets	●	The Status Quo model would see all water and wastewater assets – for both the existing and expanded networks – remain under public ownership.
Safe and reliable service	●	The Status Quo model – which is assumed to currently offer safe and reliable service – would presumably continue to provide an equivalent level of service

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		going forward.
Reduced environmental impact	◑	The environmental impact of this model is mixed. Under the Status Quo model, Mapleton could conceivably integrate the water and wastewater networks with other infrastructure in a manner that minimizes the environmental impact. However, having the Township retain responsibility for the networks would fail to capitalize on private sector expertise in design, construction, operations, and maintenance that could optimize environmental benefits.
Competitive development charges	○	The Status Quo model would lack strong incentives for the efficient delivery of infrastructure to service new developments in Mapleton (e.g., via less risk transfer to the parties best-suited to manage different risks); as a result, the associated costs would be higher under this model than the concession models. These additional costs would ultimately be borne through higher development charges.
Equal or better service levels	◑	The Status Quo model offers limited incentive for improved service levels. This is due to: (1) the DBB nature of the design and construction of the networks offering limited incentive for contractors to offer an integrated solution that improves service levels; and (2) the difficulty in incentivizing OCWA to deliver improved service levels due to the inability to enforce holdbacks or deductions against a government entity. However, service levels could presumably be maintained at current levels given the experience with the asset and track record of achieving these service levels.
Cooperative working relationship with Mapleton	●	Under the Status Quo model, responsibility for the water and wastewater networks would remain with the Township. This would presumably allow for effective coordination with Mapleton's economic development and planning departments due to the close working proximity and potential pre-existing relationships within the Township's municipal government.
Explore additional economic opportunities	○	The Status Quo model would entail working with the same parties as Mapleton has to-date, thereby offering no additional opportunities related to investment or economic benefits (e.g., related to job creation, innovation in delivery that lowers rates to spur economic development, etc.).

6.3 Concession Model

The table below sets out the ratings and associated rationale for the Concession Model against each of Mapleton's stated objectives for the Project:

Table 15: Concession Model – Qualitative Analysis

Objective	Rating	Rationale
Mapleton as regulator	●	Under the Concession Model, Mapleton would retain its role as regulator, including the rate-setting and rate-making functions. Rates would be determined based on rate applications from the Concessionaire, which would include OPEX and CAPEX projections for the existing and expanded networks.
Reputable party	●	Mapleton has emphasized their desire to partner with a reputable party. All bids at the RFQ stage were from consortia comprised of parties with strong reputations in the water and wastewater space in Canada.
Financial, technical, and operational expertise and capacity to deliver project	●	Mapleton has structured the procurement process to emphasize the financial, technical, and operational expertise of the Concessionaire. This includes asking for significant detail on the project experience, team, and financial capacity of consortia at the RFQ stage. All consortia that were shortlisted at the RFQ stage possessed significant financial, technical, and operational expertise.
Maintain public ownership of assets	●	The Concessionaire would access Mapleton's existing water and wastewater infrastructure via a lease agreement or a fixed term operating license, thus allowing Mapleton to maintain public ownership over these assets at all times.
Safe and reliable	●	Under a Concession Model, the project agreement would presumably include detailed key performance indicators ("KPIs") that require the Concessionaire to provide a safe

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service		and reliable level of service when providing water and wastewater services. The consortia bidding to deliver the project would – in order to be selected as the preferred proponent – be required to demonstrate experience delivering water and wastewater infrastructure safely and reliably.
Reduced environmental impact	◑	The environmental impact of this model is mixed. The Concession Model would create limited incentives for the Concessionaire to bring forward innovative solutions to minimize environmental impact unless such costs can be passed onto ratepayers by being included in the asset base. On the other hand, the Concession Model would also draw on private sector expertise in the design, construction, operations, and maintenance of the networks to optimize delivery and generate environmental benefits.
Competitive development charges	●	The Concession Model would see risks (e.g., related to cost, schedule, etc.) transferred to the parties best-suited to manage them, thus minimizing the cost of delivering infrastructure to service new developments (and thus reduce required development charges).
Equal or better service levels	● (Anticipated)	Since the proposed procurement process to select a Concessionaire would see proponents bid draft project agreements with potentially different service levels, the rating is an anticipated rating. Given that the Concession Model would draw on a qualified Concessionaire, it is expected to result in equal or better service levels than at present.
Cooperative working relationship with Mapleton	◑	The Concessionaire would need to work closely with Mapleton's economic development and planning departments to effectively manage the existing networks and develop new infrastructure. In light of the level of interest in this transaction to-date given the attractiveness of the sector to bidders, this would likely see the Concessionaire want to ensure they have a 'happy client' in the Township. However, the Concessionaire would still have an incentive to maximize the value of the asset base to increase their return under a regulated utility model. This would create a difference in incentives (since Mapleton would want to keep the asset base smaller to keep rates low) that could impact the working relationship.
Explore additional economic opportunities	●	The involvement of an industry-leading Concessionaire would bring external financing and newfound expertise to Mapleton as part of delivering this project, the benefits of which could be passed on to local residents which would spur economic development. The Concessionaire could also seek to maximize the involvement of local workers in order to generate goodwill with the Township and local residents.

6.4 Concession Model with CIB Financing

The table below sets out the ratings and associated rationale for the Concession Model with CIB Financing against each of Mapleton's stated objectives for the Project:

Table 16: Concession Model with CIB Financing – Qualitative Analysis

Objective	Rating	Rationale
Mapleton as regulator	●	Under the Concession Model with CIB Financing, Mapleton would retain its role as regulator, including the rate-setting and rate-making functions. Rates would be determined based on rate applications from the Concessionaire, which would include OPEX and CAPEX projections for the existing and expanded networks.
Reputable party	●	All bids at the RFQ stage were from consortia comprised of parties with strong reputations in the water and wastewater space in Canada. The CIB is a new entity in the Canadian infrastructure sector; however, it is a creation of the federal government and thus reasonable to consider it reputable.
Financial, technical, and operational expertise and capacity to deliver project	●	The procurement process Mapleton has opted for requires the Concessionaire to possess significant financial, technical, and operational expertise. All consortia that were shortlisted at the RFQ stage possessed significant financial, technical, and operational expertise. The CIB also has significant financial expertise by virtue of their team's deep experience in infrastructure and project finance.

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Maintain public ownership of assets	●	Ownership of the water and wastewater networks would remain with Mapleton at all times during the concession, as the Concessionaire would access the infrastructure via a lease agreement or a fixed term operating license.
Safe and reliable service	●	The project agreement would presumably include detailed KPIs that require the Concessionaire to provide a safe and reliable level of service when providing water and wastewater services. The consortia bidding to deliver the Project would – in order to be selected as the preferred proponent – be required to demonstrate experience delivering water and wastewater infrastructure safely and reliably.
Reduced environmental impact	◑	This model would create limited incentives for the Concessionaire to bring forward innovative solutions to minimize environmental impact unless such costs can be passed onto ratepayers by being included in the asset base. On the other hand, this model would also draw on private sector expertise in the design, construction, operations, and maintenance of the networks to optimize delivery and generate environmental benefits.
Competitive development charges	●	The Concession Model with CIB Financing would see risks (e.g., related to cost, schedule, etc.) transferred to the parties best-suited to manage them, thus minimizing the cost of delivering infrastructure to service new developments (and thus reduce required development charges).
Equal or better service levels	● (Anticipated)	Since the proposed procurement process to select a Concessionaire would see proponents bid draft project agreements with potentially different service levels, the rating is an anticipated rating. Given that the Concession Model with CIB Financing would draw on a qualified Concessionaire, it is expected to result in equal or better service levels than at present.
Cooperative working relationship with Mapleton	●	Similar to the Concession Model, the Concession Model with CIB Financing would see the Concessionaire have an incentive to work closely with Mapleton to develop and manage the networks while also having an incentive to maximize the asset base to increase their return. These different incentives would create a mixed working relationship. The involvement of the CIB would likely simplify the working relationship as compared with a third party debt provider. This is because the CIB is an entity created by the federal government (meaning they understand the needs of a municipality like Mapleton as well as the flexibility of the CIB to offer tailored financing solutions to spur the development of new infrastructure.
Explore additional economic opportunities	●	Under the Concession Model with CIB Financing, an industry-leading Concessionaire would deliver the Project and – in the process – bring external financing and newfound expertise to Mapleton as part of delivering this project. The benefits of this could be passed on to local residents which would spur economic development. The Concessionaire could also seek to maximize the involvement of local workers in order to generate goodwill with the Township and local residents.

6.5 Summary of Results

Based on the analysis above, both the Concession Model and Concession Model with CIB Financing better meet Mapleton's stated objectives better than the Status Quo.

Table 17: Summary – Qualitative Analysis

Objective	Status Quo	Concession Model	Concession Model with CIB Financing
Mapleton as regulator	●	●	●
Reputable party	●	●	●
Financial, technical, and operational expertise and capacity to deliver project	○	●	●
Maintain public ownership of assets	●	●	●

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Safe and reliable service	●	●	●
Reduced environmental impact	◑	◑	◑
Competitive development charges	○	●	●
Equal or better service levels	◑	● (Anticipated)	● (Anticipated)
Cooperative working relationship with Mapleton	●	◑	●
Explore additional economic opportunities	○	●	●

6.6 Additional Qualitative Benefits

In addition to the benefits described above, the Concession Model with CIB Financing offers additional qualitative benefits worth noting. These include:

- Allows Mapleton to focus on their core role as a regulator instead of project delivery (which is better-suited for third parties with extensive experience in that role);
- Improves cost certainty for ratepayers by virtue of rate application cycles establishing the asset base from which rates will be derived;
- Offers service guarantees by virtue of the project agreement presumably including KPIs the Concessionaire must achieve;
- Helps Mapleton access the latest technology to maximize service quality by virtue of the incentive for the Concessionaire to propose including new technology in the asset base;
- Transferring responsibility for the networks to a single consortium allows for a whole-of-lifecycle approach to managing the network, thus mitigating integration risk; and
- The proposed 20-year concession allows for a possible re-tendering opportunity at the end of the term. This creates an incentive for the Concessionaire to deliver strong performance during the concession to avoid being replaced at the end of the term due to poor performance.

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7. Conclusions

7.1 Conclusions

PwC was engaged to assess three delivery options under consideration to deliver Mapleton's water and wastewater network, namely the: Status Quo; Concession Model; and Concession Model with CIB Financing. As part of this analysis, PwC examined each model to assess the financial impact to ratepayers, risk, and qualitative benefits of each option. This analysis yielded the following conclusions:

- The Concession Model with CIB Financing is the best option to deliver Mapleton's water and wastewater networks given the financial, risk, and qualitative benefits it offers;
- The Concession Model with CIB Financing offers rate savings compared with the Concession Model given the lower financing costs it offers;
- On a cash flow basis, the Status Quo model results in large spikes to rates as a result of funding 50% of capital and lifecycle expenditures directly through rate revenue in a given year (with the remaining 50% funded via debt issuance that requires future ratepayers to repay debt service costs via higher rates);
- However, a simple comparison of rates fails to take into account the value of the risk transfer offered by both concession models;
- Any potential efficiencies related to capital and operating spending that could be brought by the private sector have not been considered in this analysis due to the uncertainty around the amount and timing of any potential savings;
- When comparing the options on a risk-adjusted NPV basis, the Concession Model with CIB Financing generates the best value for money for Mapleton by virtue of having the lowest NPV;
- Both concession models transfer a substantial amount of risk to the Concessionaire. This is due to private sector incentives to minimize costs (including the risk Mapleton – as regulator – declines to approve requested cost increases) and drawing on the Concessionaire's technical, operational, and financial expertise in delivering water and wastewater networks;
- By contrast, the Status Quo would see Mapleton retain a significant amount of project risks, including those related to the rate setting process (i.e., rates not covering costs), the residual value of the networks at the end of the concession term, higher than expected construction and rehabilitation costs, and significant escalation of unplanned and unanticipated increases in rates due to future CAPEX spending;
- The Status Quo model poses significant financial risk to Mapleton as the additional debt the Township would need to issue to finance 100% of future capital expenditures would consume the vast majority (i.e., ~86.4%) of their remaining debt capacity. This could impose significant financial constraints and risks when it comes to financing other municipal services;
- The structure of the CIB Financing (based on the terms current to the publishing of this business case) would offer the Concessionaire considerable flexibility to draw on debt as needed. This would help address the uneven capital spending schedule Mapleton has developed for New Infrastructure, which would otherwise require significant debt issuance from the Town and/or significant escalation of unplanned and unanticipated increases in rates in the years where investments are made;
- Under either concession model, should bidders structure their financial submission to include rent payments to Mapleton for access to the existing infrastructure, BLG believes this could allow the Concessionaire to claim these rent payments as a deductible expense for tax purposes. This could allow the Concessionaire to reduce the rate revenue required from consumers to cover capital and operating costs and generate a return;
- Under the concession models, the Concessionaire would able to take advantage of depreciation expensing throughout the concession term, which could offer tax planning benefits to ratepayers; and
- The Concession Model with CIB Financing best meets the qualitative objectives set out for Mapleton in the April 3, 2019 RFQ document, including the ability to work with a party with substantial technical, operational, and financial expertise, minimize risk to the Township, minimize significant escalation of unplanned and unanticipated increases in rates, and maintaining public ownership of the network.

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Appendix A – RFQ Stage

The RFQ saw bidders evaluated on five criteria under the following scoring regime:[42]

Table 18: RFQ Criteria and Scoring

Evaluation Criteria	Description	Weighting
Relevant experience and water/wastewater systems	Describe the scope of the direct experience of the party in planning, engineering, designing, permitting, constructing, and operating private, municipal and regional water and wastewater systems. This assessment will include an evaluation of the depth of experience of any key personnel, consultants and contractors retained by the party. The party should clearly identify three (3) specific projects and describe their experience including identifying the jurisdiction, system size and characteristics, number of customers served, and nature of the interest in the system (owner, operator, lessee, Concessionaire, other).	30
Team qualifications	Résumés for all key personnel proposed to take lead responsibilities for the Project, evidencing experience with respect to some or all of the functional skills required to deliver the Project.	25
Experience operating a regulated monopoly service	Financial strength of the party and identify the sources of the equity and debt financing, its experience in arranging equity and debt financing for water and wastewater projects. Parties must provide their audited financial statements for the last three (3) years (or unaudited if audited financial statements are not available at this time).	20
Financial capacity	Commercial reputation and record of the party and its affiliates, including the party's record with respect to claims, other commercial and contractual disputes, and participation in and findings made in connection with legal proceedings including civil and criminal litigation and administrative law and judicial inquiries related to procurement and related commercial transactions involving the party.	15
Commercial references	Scope and depth of experience of the party in operating a utility in a rate-regulated environment, including its experience in working with municipalities, regulatory agencies and other quasi-judicial administrative tribunals, governments or other rate-making entities. The party should clearly describe specific examples of such experience including experience with respect to safety, innovation in delivery of services and customer service.	10
Total		**100**

Bidders were required to achieve a minimum aggregate score of 70% across all categories as well as a minimum score of 70% on the criterion "Relevant Experience with Water/Wastewater Systems".

Mapleton issued the RFQ on April 3, 2019, with bids due on April 30, 2019.

[42] Per Mapleton's Request for Qualifications document issued April 3, 2019

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Appendix B – Risk Analysis

Overview and Methodology

Risk identification, quantification, and analysis is a key step in the determination of a project's risk-adjusted whole-of-life costs and the expected retained risk by the Township. Once project risks are identified and quantified, the results inform the selection of a delivery option. Please note that all risk figures in this section have been rounded to the nearest dollar and thus may produce rounding errors. The risk quantification process for this project consisted of three steps:

1. ***Identification, Definition, and Prioritization of Risks***

The risk identification process results in a list of risks known as a "risk register", including their detailed definitions and descriptions. PwC developed a list of 22 risks for potential inclusion in the risk assessment. The risk assessment was limited to 22 risks due to the time constraints to complete the business case before RFP issuance, with the risks viewed as having the greatest effect on this specific project being prioritized for inclusion in the register. The list of risks was also reviewed and agreed to by representatives of Mapleton.

2. ***Estimation of the Probability that Each Risk Will Occur, the Potential Degrees of Impact, and Allocation Between the Parties***

PwC used knowledge derived from previous water and wastewater projects to pre-populate the risk register with probability, impact, and allocation figures for each risk. This was intended to help facilitate a productive, concise discussion during the risk workshop. Please refer to Appendix C for a list of risk workshop participants.

During the workshop, estimations of the probability, impact, and allocation for each risk were determined by relying on PwC's experience in the water and wastewater sector as well as the knowledge and experience of Mapleton representatives when it comes to capital project delivery and the specific requirements of this project.

The quantification exercise involved consideration of the probability of the risk occurring (as a percentage from 0%-100%) and estimation of the cost impact if the risk were to occur (as a percentage of the Project's base costs). Three impact parameters were considered in the workshop, namely:

- Low (10th percentile impact, or the 'upside outcome');
- Typical (most likely outcome, defined as the mode); and
- High (90th percentile impact, or the 'downside outcome').

Each risk was allocated to a cost base to estimate the impact to project costs. Costs bases were assumed to be the same under all models:

Table 19: Cost Bases

Cost Base ($NPV)	Value
Design & Construction	$17,233,585
Operations & Maintenance	$13,325,128
Lifecycle & Rehabilitation	$2,603,161
Total Contract	$33,161,875

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The cost base refers to the costs associated with each project phase, expressed in NPV terms. This information was derived from information provided by the Township and Watson & Associates regarding Mapleton's future capital and operating budgets, project timelines, and key financial assumptions.

3. *Allocation of Risks Between Mapleton and the Concessionaire*

Risks were then allocated to the party best-suited to manage them (i.e., to minimize the cost of each risk if it were to occur). The allocation depends on the capacity of the party to control the risk, the availability of mitigation measures, and how responsibilities are assigned (based on the definition of each model as set out in the "Options Under Consideration" section of this report).

For the purposes of the workshop and this report, potential allocations were limited to three options:

1. 100% retained by Mapleton (or "public sector");
2. 100% transferred to the private sector; or
3. Shared 50%/50% between the public and private sectors.

During the workshop, participants validated or updated the allocation for each risk discussed based on their understanding of the Project as well as their experience and insights for similar projects.

Please refer to Appendix D for meeting notes from discussions that took place during the risk workshop on each risk.

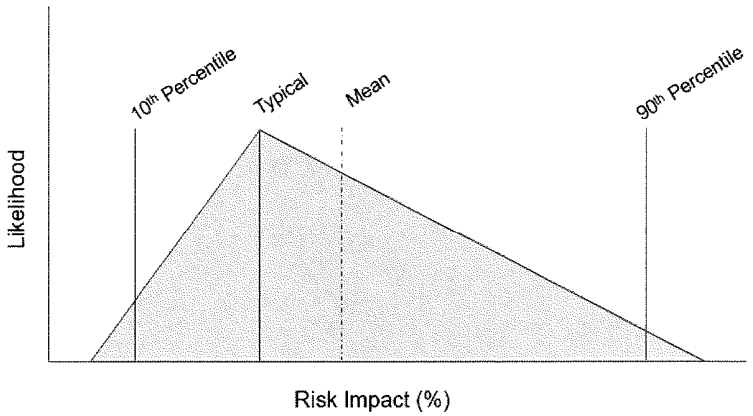
Total Quantified and Retained Risk Results

The risk quantification process in the workshop determines or validates the probability of occurrence, impacts, and allocation for each identified risk. These values were either sourced from industry standards and validated by workshop participants, or estimated by the subject matter experts during the risk workshop.

The potential impact for each risk is described using a triangular probability distribution. Each triangular probability distribution is defined by the estimated cost impact parameters of 10th percentile (low risk), typical, and 90th percentile (high risk). A mean risk impact value can be mathematically determined for each probability distribution defined for each risk using Oracle Crystal Ball software. The mean risk value was used for the purpose of risk quantification[43].

An illustrative example of a triangular probability distribution for risk impact is shown below in Figure 14.

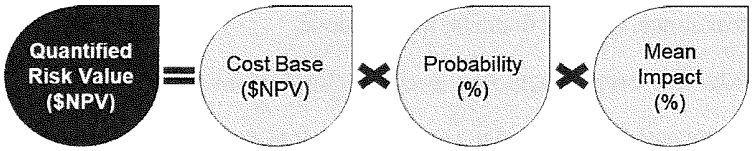
Figure 14: Illustrative Example of a Triangular Distribution



[43] As per Infrastructure Ontario (IO) 'Assessing Value for Money, An Updated Guide to Infrastructure Ontario's Methodology – March 2015' guidance document and PwC precedents

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The quantified risk values are calculated using the following equation:



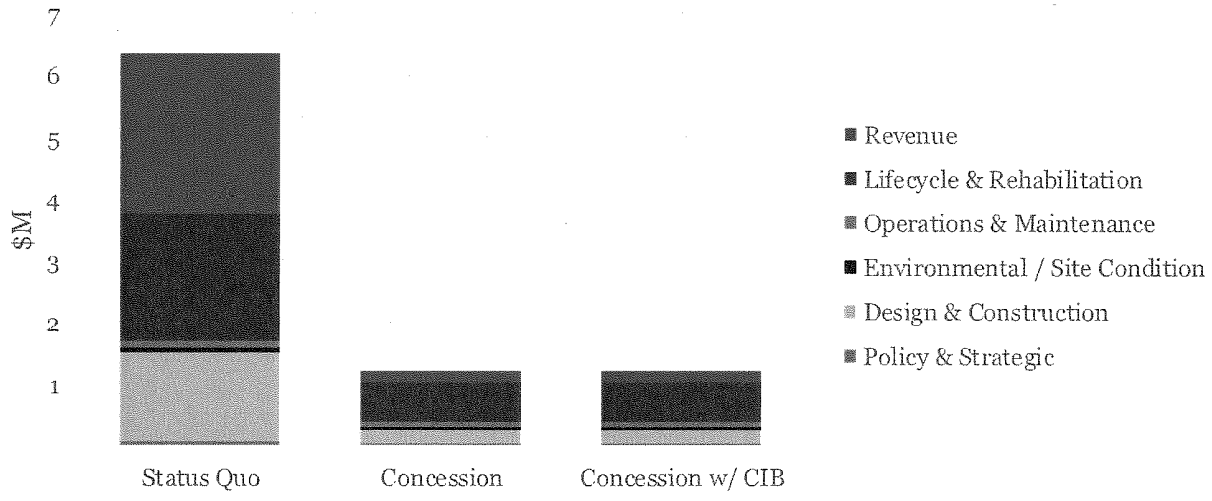
The quantified risk for each delivery option is shown below, aggregated by risk category and shown as an overall total. The total quantified risk consists of the sum of all risks for the Project based on the mean impact for each. Based on the chart below, it becomes clear that the Status Quo model entails significantly more risk than either the Concession Model or Concession Model with CIB Financing.

Table 20: Total Quantified Risk Values (NPV)

Cost Base ($NPV)	Status Quo	Concession Model	Concession Model with CIB Financing
Policy & Strategic	$58,033	$36,791	$35,819
Design & Construction	$1,443,360	$217,493	$217,493
Environmental / Site	$72,722	$64,106	$64,106
Operations & Maintenance	$117,443	$81,260	$81,260
Lifecycle & Rehabilitation	$2,061,284	$627,360	$627,360
Revenue	$2,602,412	$174,186	$174,186
Total	**$6,355,254**	**$1,201,196**	**$1,200,224**

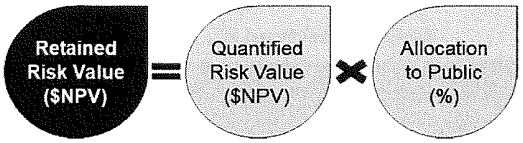
The figure below offers a graphical comparison of total quantified risk for each delivery option.

Figure 15: Total Quantified Risk Graph (NPV)



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The value of each risk can be retained, transferred, or shared. The retained risk value to Mapleton is calculated using the following equation where the allocation is a value of 100% for Mapleton, 100% for the private sector, or 50% for each of Mapleton and the private sector.



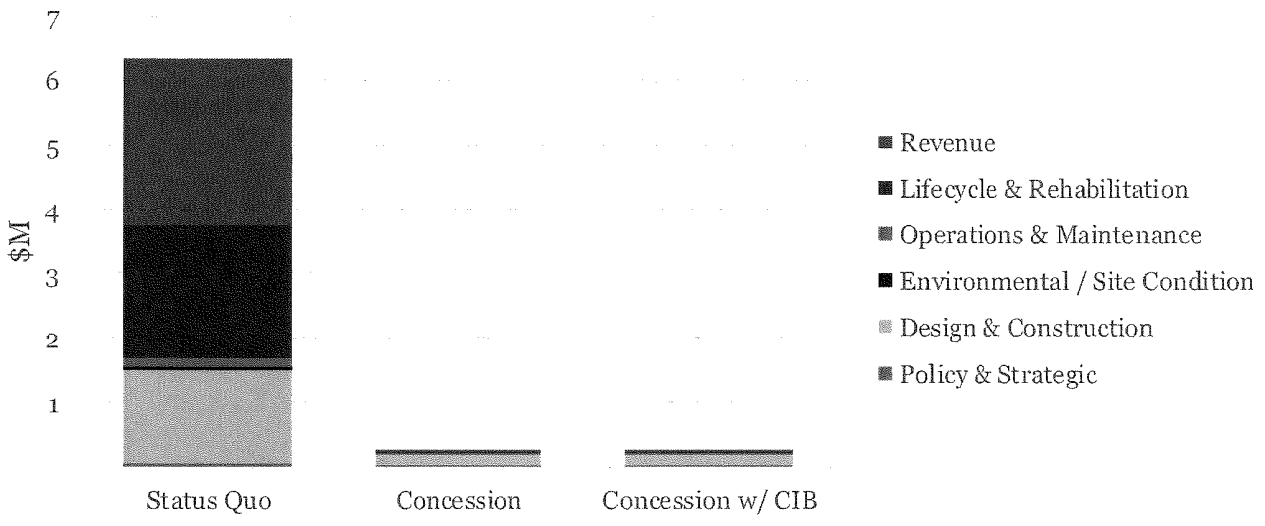
The retained risk (i.e., retained by Mapleton) for each delivery option is shown below, aggregated by risk category and shown as an overall total. The risk retained by Mapleton consists of the sum of all retained risks, including the retained portion of shared risks based on the mean impact for each.

Table 21: Retained Risk Values (NPV)

Cost Base ($NPV)	Status Quo	Concession Model	Concession Model with CIB Financing
Policy & Strategic	$58,033	$24,456	$23,484
Design & Construction	$1,443,360	$157,961	$157,961
Environmental / Site	$64,020	-	-
Operations & Maintenance	$117,443	$35,785	$35,785
Lifecycle & Rehabilitation	$2,061,284	$23,625	$23,625
Revenue	$2,602,412	$14,852	$14,852
Total	**$6,346,552**	**$256,679**	**$255,707**

The figure below offers a graphical comparison of total retained risk for each delivery option.

Figure 16: Retained Risk Graph (NPV)



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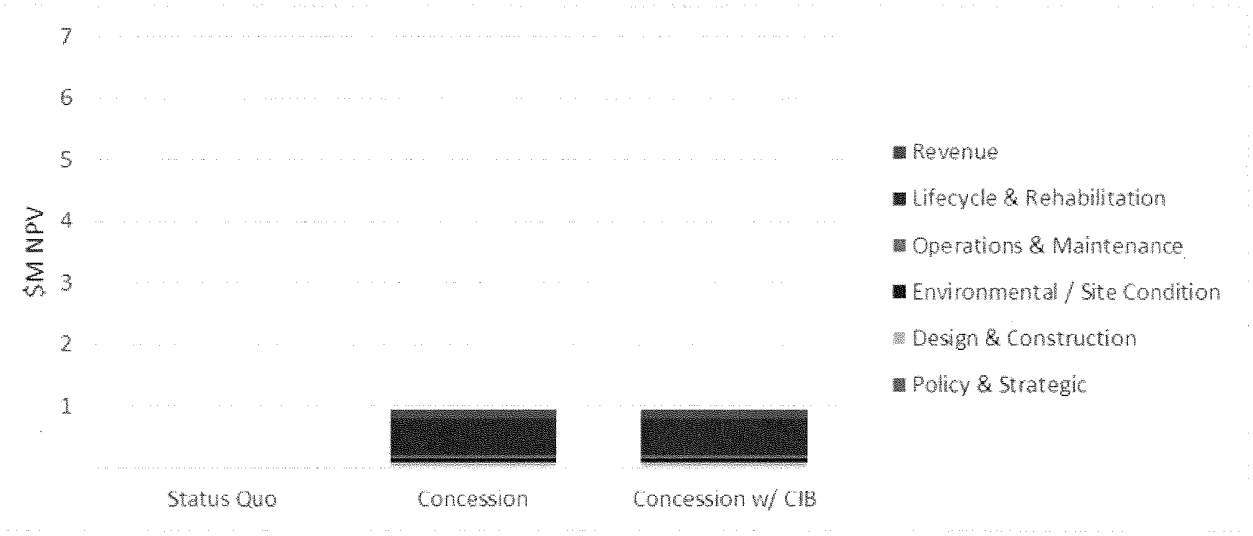
The transferred risk (i.e., transferred to the private sector) for each delivery option is shown below, aggregated by risk category and shown as an overall total. The risk transferred to the private sector consists of the sum of all transferred risks, including the transferred portion of shared risks based on the mean impact for each.

Table 22: Transferred Risk Values (NPV)

Cost Base ($NPV)	Status Quo	Concession Model	Concession Model with CIB Financing
Policy & Strategic	-	$12,335	$12,335
Design & Construction	-	$59,531	$59,531
Environmental / Site	$8,703	$64,106	$64,106
Operations & Maintenance	-	$45,475	$45,475
Lifecycle & Rehabilitation	-	$603,735	$603,735
Revenue	-	$159,333	$159,333
Total	**$8,703**	**$944,515**	**$944,515**

The figure below offers a graphical comparison of total transferred risk for each delivery option.

Figure 17: Transferred Risk Graph (NPV)



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Top 5 Risks – Status Quo

The top 5 retained risks for the Status Quo model are shown below:

Table 23: Status Quo – Top 5 Retained Risks (NPV)

Rank	Risk #	Risk Description	Retained Value
1	601	Rate Setting Process	$2,210,792
2	504	Asset Residual	$1,507,939
3	206	Higher than Expected Construction Costs (including inflation risk)	$775,511
4	501	Rehabilitation Works	$498,482
5	603	Significant escalation of unplanned and unanticipated increases in rates	$388,636
		Top 5 Risk Total	**$5,381,360**

The top 5 retained risks for the Status Quo model represent ~84.7% of the total quantified retained risk for this option. The most significant risks for this option include:

- ***Rate Setting Process*** – Mapleton indicated that – based on their past experience – the probability of rates failing to cover expenses under the Status Quo model is very high; therefore, a high figure (i.e., 50%) was assumed for the probability. Similarly, the Township indicated that the impact figures should be significant as the Status Quo model has, to-date, seen Mapleton need to draw on the municipal tax revenue base to cover a large portion of water and wastewater costs. It was suggested that these factors are likely to persist under the Status Quo going forward as changing the rate setting process to completely cover costs (without additional benefits in how the networks is delivered) is unlikely to be approved by Council.
- ***Asset Residual*** – The Status Quo model presumes that Mapleton would procure separate design and construction contracts for future CAPEX in a manner similar to a Design-Bid-Build (i.e., the Township would have to coordinate the integration of a project's design and construction elements). This type of contractual structure lacks strong incentives for the design and construction firms to work together to optimize the long-term value of the asset as they are procured under separate contracts. While this risk can be mitigated to some extent through the development of specifications requiring the networks to be in a certain condition at the time of handback, such an approach is potentially time-consuming and costly for Mapleton and is generally considered less effective than integrated design and construction solutions.
- ***Higher than Expected Construction Costs (including inflation risk)*** – Mapleton believed the Status Quo would have higher probability and impact figures regarding construction costs. This flows from the Township – given its small size – having comparatively less buyer power to exert when negotiating with materials suppliers and labourers as compared with the large construction firms, thus making them more susceptible to cost increases. This view is consistent with general industry experience when it comes to this type of delivery model, which contains weaker incentives for the private parties to contain construction costs. In addition, under the Concession Model or Concession Model with CIB Financing, the Concessionaire would have an incentive to perform detailed planning and budgeting of construction costs as part of developing their bid during both the procurement and rate application processes. This would reduce the likelihood of higher than expected construction costs as compared with the Status Quo.

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- ***Rehabilitation Works*** – The risk related to rehabilitation works tends to be more thoroughly accounted for in the planning, design, and costing of models with substantial private involvement in delivery than under the Status Quo. Accordingly, Mapleton concluded that the probability and impact figures for this risk would be substantially higher under the Status Quo than the other two models.
- ***Significant escalation of unplanned and unanticipated increases in rates*** – Mapleton's current capital budget calls for four large capital expenditures over the next 20 years. Given that the current funding model would see these years require significant increases in development charges, rates, and/or debt (ultimately, to be repaid via rates and/or development charges) to cover capital costs, the probability and impact of significant escalation of unplanned and unanticipated increases in rates under the Status Quo was deemed to be high. In addition, under the concession models, given the potential for Mapleton (in their role as regulator) to decline to approve requested cost increases, the Concessionaire would have an incentive to control costs more effectively than would the Township under the Status Quo.

Top 5 Risks – Concession Model and Concession Model with CIB Financing

The Concession Model and Concession Model with CIB Financing produced identical figures for each option's top 5 risks; therefore, the figures and analysis listed below can be considered to apply to both options:

Table 24: Concession Model – Top 5 Retained Risks (NPV)

Rank	Risk #	Risk Description	Retained Value
1	206	Higher than Expected Construction Costs (including inflation risk)	$100,983
2	201	Scope Changes (during construction)	$36,647
3	403	Higher than Expected Operating Costs (including inflation risk)	$35,637
4	503	Latent Defects on Existing Assets	$15,816
5	103	Regulatory Approvals for Design and Construction Activities	$12,335
		Top 5 Risk Total	**$201,418**

The top 5 retained risks for the Concession Model and Concession Model with CIB Financing represent ~16.8% of the total quantified retained risk for each option. The most significant risks for each option include:

- ***Higher than Expected Construction Costs (including inflation risk)*** – Under both models, the Concessionaire would have an incentive to perform detailed planning and budgeting of construction costs as part of developing their bid during the procurement phase as well as during the rate application process. This would reduce the likelihood of higher than expected construction costs as compared with the Status Quo. At the same time, this is the risk with the greatest retained value under both concession models as the regulated utility compensation structure would create an incentive for the Concessionaire to maximize the value of the asset base (in order to increase their return on a dollar basis), thereby reducing the incentive to contain construction costs.
- ***Scope Changes (during construction)*** – The increased level of due diligence under the concession models reduces the likelihood of scope changes during construction as compared with the Status Quo. Nonetheless, Mapleton's needs can still evolve such that scope changes during construction could occur. Moreover, the

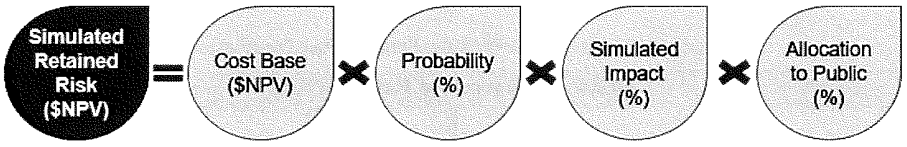
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Concessionaire would have an incentive to add to the value of the asset base if possible in order to increase their return on a dollar basis.

- ***Higher than Expected Operating Costs (including inflation risk)*** – While the private sector is assumed to be able to exert greater buyer power over labourers (which was presumed to be the biggest driver of operating costs), the Concessionaire would also lack an incentive to contain operating costs under the concession models as OPEX would be a pass through cost to ratepayers. Impact figures deemed to be the same under all models and were derived by looking at historical data in Canada regarding low/typical/high wage growth inflation.
- ***Latent Defects on Existing Assets*** – Industry experience suggests that the private sector is often unwilling to assume the risk of latent defects on existing assets; therefor, the probability, impact, and allocation were deemed to be the same regardless of the model. This risk is one of the more significant ones under the concession models given that Mapleton's water and wastewater networks are several decades old, thus making it more likely to contain latent defects that would impact costs during the term of the concession.
- ***Regulatory Approvals for Design and Construction Activities*** – Mapleton indicated the most significant regulatory requirement involves approval from the Province of Ontario's Ministry of Environment. While it was thought the Concessionaire would have extensive experience navigating the regulatory approval process, this process would involve an approval element that could be impacted by the Province being slow to grant approvals.

Sensitivity Analysis

A Monte Carlo analysis is used to compute the probability distribution of the total of retained risks for the project. In a Monte Carlo simulation, trial scenarios are computed using random number generation. The software also calculates the simulated risk impact value, which is randomly selected from within each risk's respective impact triangular distribution. A simulated retained risk value is obtained for each risk using these simulation values applied to the following formula:



The total simulated retained risk for the Project for each trial is the sum of all retained risk values in that specific trial. A Monte Carlo analysis aggregates the computed trial scenarios to provide the simulated probability distribution of the retained risk for the project. The probability distribution is used to facilitate user understanding of the retained risk confidence interval.

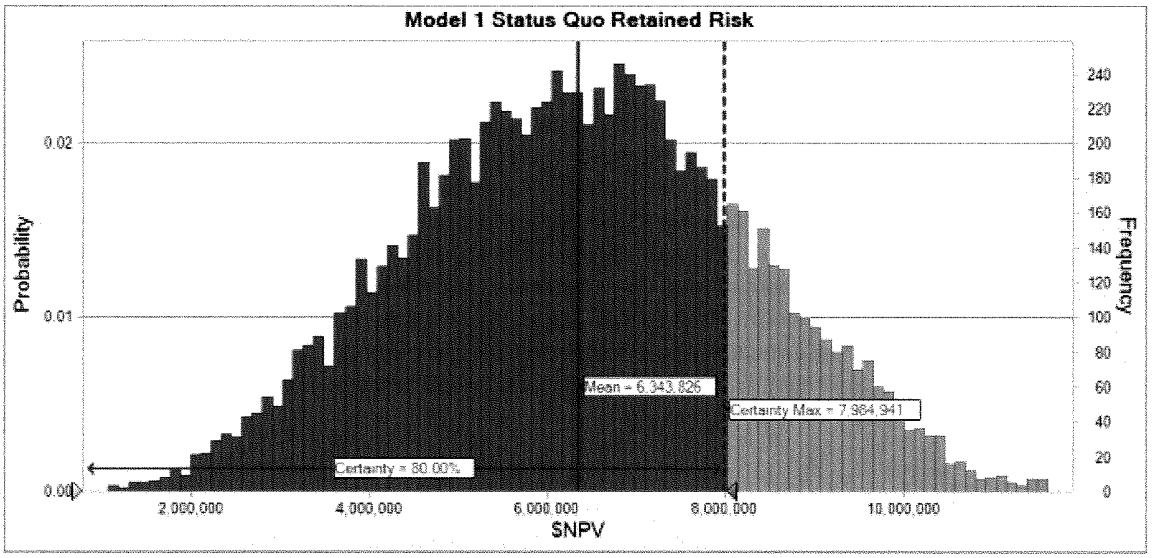
A Monte Carlo analysis using 10,000 trial scenarios has been completed for each of the potential delivery options and the resulting probability distributions are shown below. The Monte Carlo generated histograms show the risk value that a set percentage of trials did not exceed, with the retained risk at an 80% confidence level shown for reference.

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Status Quo Model

The resulting probability distribution for the Status Quo model is shown below:

Figure 18: Status Quo Total Retained Risk Distribution

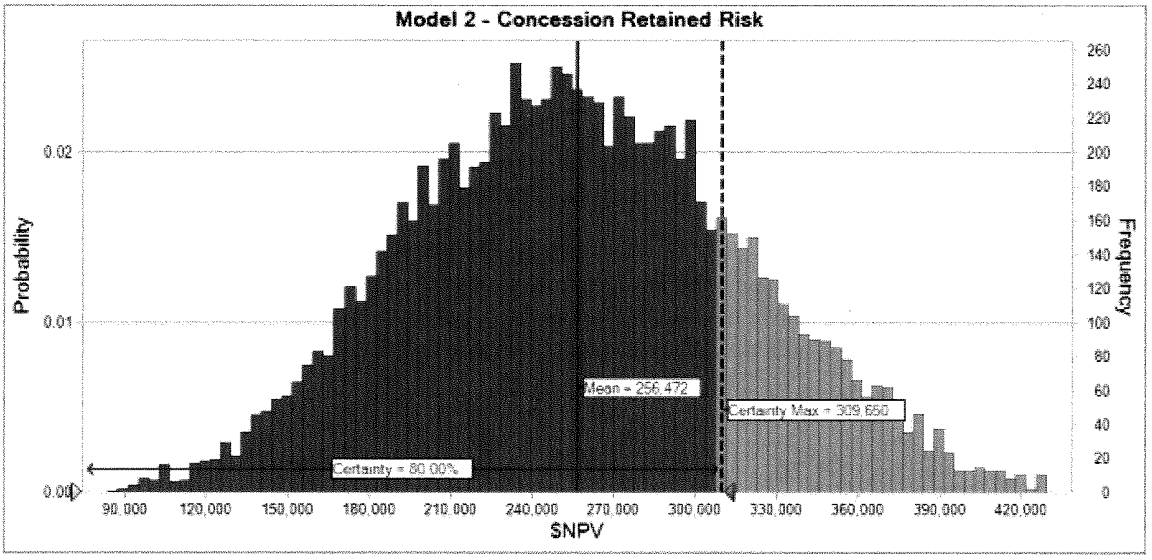


The figure shows the risk value that 80% of trials did not exceed $7,984,941 for the Status Quo.

Concession Model

The resulting probability distribution for the Concession Model is shown below:

Figure 19: Concession Model Total Retained Risk Distribution



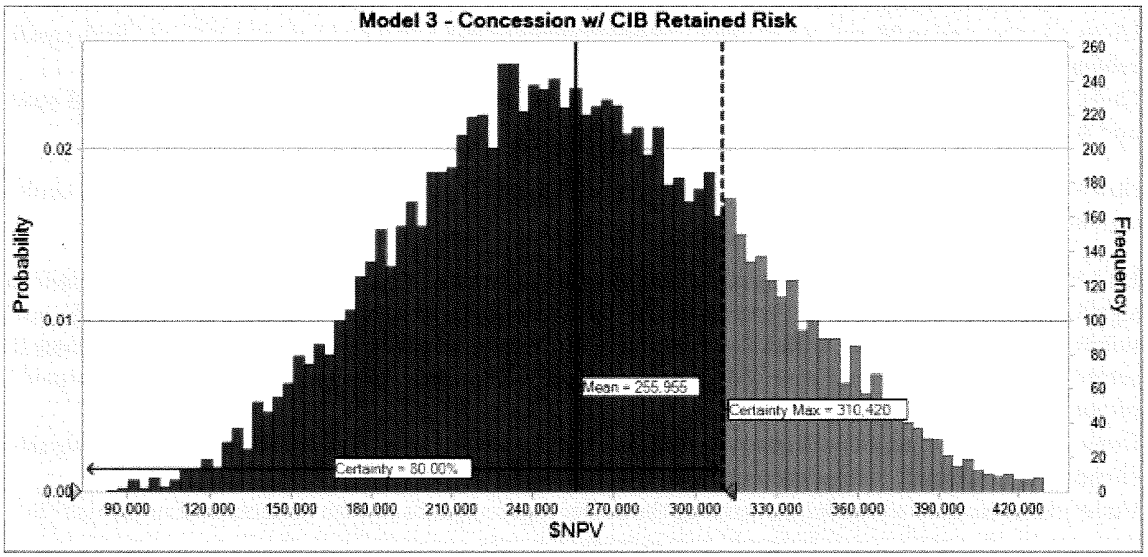
The figure shows the risk value that 80% of trials did not exceed $309,650 for the Concession Model.

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Concession Model with CIB Financing

The resulting probability distribution for the Concession Model with CIB Financing is shown below:

Figure 20: Concession Model with CIB Financing Total Retained Risk Distribution

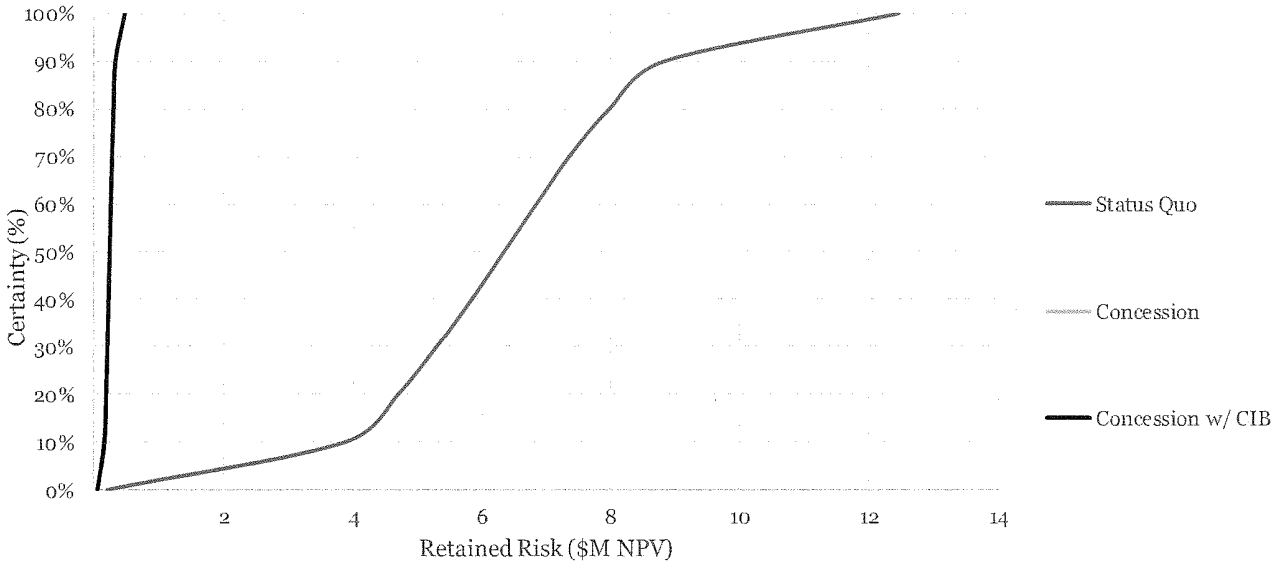


The figure shows the risk value that 80% of trials did not exceed $310,420 for the Concession Model with CIB Financing.

Implications

The probability distribution curves for each of the delivery models are graphed below. This shows the total retained risk at different confidence intervals (i.e., the certainty %):

Figure 21: Total Retained Risk Probability Distribution Curves



The results of the Monte Carlo simulation analysis and probability distribution curves show:

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- The Concession Model and Concession Model with CIB Financing have nearly identical risk profiles across all confidence levels, and produce risk levels far lower than the Status Quo model;
- The Status Quo model exposes Mapleton to the highest level of retained risk at every confidence level. Under this model, we are 50% confident retained risk will not exceed $5,743,426 and 80% confident retained risk will not exceed $10,720,483;
- Under the Concession Model, we are 50% confident retained risk will not exceed $98,786 and 80% confident retained risk will not exceed $521,979; and
- Under the Concession Model with CIB Financing we are 50% confident retained risk will not exceed $98,805 and 80% confident retained risk will not exceed $502,756.

Listed below are suggestions for Mapleton's consideration on how some risks associated with these options could be mitigated (non-exhaustive list):

- Under either concession model, it is important to ensure that rate setting decisions are made by individuals with significant technical, operational, and financial expertise of the water and wastewater network. This would help minimize the risk associated with a Concessionaire's incentive to maximize the asset base (to maximize their return on a dollar basis) and/or see OPEX increase (since it has been assumed these costs would be paid for by ratepayers on a pass through basis);
- Ensuring the project agreement entered with a Concessionaire includes detailed KPIs on the most significant elements of the Project is important in order to mitigate several risks;
- Under either concession model, structuring the project agreement to put the Concessionaire "at-risk" for cost overruns (to the extent possible) would help mitigate the risks associated with the Concessionaire's incentive to maximize the value of the asset base by not controlling costs; and
- Clearly defining Mapleton's objectives upfront (to the extent possible) would allow potential bidders under either concession model to understand Mapleton's business requirements and thus effectively plan and budget for the project.

Please note that the risk assessment was limited to these 22 risks due to the time constraints to complete the business case before RFP issuance. A risk analysis examining additional risks may produce different results.

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Appendix C – Risk Workshop Attendees

The following people attended or called into the risk workshop that took place on June 11, 2019.

Table 25: Risk Workshop Attendees

Name	Title	Organization
Manny Baron	Chief Administrative Officer	Township of Mapleton
Sam Mattina	Director of Public Works	Township of Mapleton
John Morrison	Director of Finance	Township of Mapleton
John Mohle	Independent Consultant	N/A
Johanne Mullen	Partner and National Practice Leader	PwC
Geoff Malyk	Assistant Vice President	PwC
Aaron Bruyns	Senior Associate	PwC

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Appendix D – Risk Workshop Notes

The following notes reflect the risk workshops or discussions that took place on June 11, 2019:

Table 26: Risk Workshop Notes

Risk #	Risk	Notes
101	Changes in environmental and water quality regulations	• Discussion centered around likelihood of provincial changes to environmental and water quality regulations. • Determined that any increased regulatory burden would likely see Mapleton's current standards grandfathered in; therefore, low probability of change. • Determined that probability, impact, and allocation the same under all models.
102	Communications and political acceptance risk	• Mapleton determined there is low probability of pushback from the community under all models. For example, after the RFQ shortlist was announced in the local newspaper, Mapleton did not receive any inquires or complaints from the public. • Concession Model and Concession Model with CIB Financing would require some communications element though as that is important. Mapleton is considering hiring a public relations firm to assist with this, so those costs were incorporated into the impact calculations. • All models under consideration would see Mapleton retain ownership of water and wastewater networks at all times. • Mapleton viewed CIB involvement as a positive in terms of generating acceptance as this signals confidence on the part of the federal government to support the Project and additional dollars flowing to the Township. • Allocation was determined to be always borne by Mapleton regardless of model.
103	Regulatory approvals for design and construction activities	• Biggest regulatory requirement sits with Ontario's Ministry of Environment and Climate Change (MOECC). • Concessionaire would likely have extensive experience dealing with the regulatory approval process and have more resources to navigate it (as compared with Mapleton). This is borne out by Mapleton not receiving timely approval on a past water project.
201	Scope changes (during construction)	• Status quo model has a higher probability compared with concession models as the latter involves additional due diligence by the private sector that reduces the likelihood of scope changes. • Mapleton indicated that scope changes under status quo are still relatively unlikely based on their past experience. • Lower cost impact for Concession Model and Concession Model with CIB Financing. • Mapleton would bear the cost under all models.
202	Scope changes (during operations)	• Mapleton indicated that the operational requirements for the networks are stable (and governed by MOECC). Therefore, Mapleton views the probability of scope changes during operations as being equal under all models. • Same logic applies to impacts as for probabilities. • Risk borne entirely by Mapleton under all models.
203	Engineering/design risk	• Mapleton agreed the probability should be higher under the status quo model. • Impacts the same under all models. • Allocation is different between the models. Status quo borne entirely by Mapleton, whereas the Concession Model and Concession Model with CIB Financing see Mapleton's role as regulator – which could see the Township accept or refuse cost applications – see costs decline to be passed on if deemed to be due to the error of the private sector.

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Risk #	Risk	Notes
204	Project management efficiency	• Assumed Mapleton plays role of coordinating construction activities under the status quo model, whereas private sector plays that role under both the Concession Model and Concession Model with CIB Financing. • Mapleton agreed that the status quo has a higher probability and impact than the Concession Model and Concession Model with CIB Financing. • Allocation is borne 100% by Mapleton under status quo and 50%/50% under the Concession Model and Concession Model with CIB Financing as Mapleton – in their role as regulator – could decline to approve costs they deem inappropriate.
205	Schedule delivery risk	• Status quo model has the least incentive to deliver the Project on-time; conversely, both the Concession Model and Concession Model with CIB Financing models have a strong incentive to deliver the Project on-time as the sooner they do so the sooner they begin generating a return. • Determined that the Concession Model and Concession Model with CIB Financing have the same probability, impact, and allocation despite different sources of debt portion of capital structure (i.e., presumed to be on-balance sheet financing and CIB, respectively).
206	Higher than expected construction costs (including inflation risk)	• Mapleton agreed that the status quo model has higher probability and impact as compared with both the Concession Model and Concession Model with CIB Financing. • The Concession Model and Concession Model with CIB Financing also see bidders face incentives to bid lower prices to win the job. However, they may not inflate construction costs thereafter as they would face the risk of Mapleton – in their role as regulator – declining to approve costs they deem inappropriate.
207	Capital projects risks (e.g., mechanical and electrical failures)	• Mapleton remarked that the electrical systems involved in a water and wastewater networks have redundancy built in the form of back-up systems and that mechanical failures are driven in large part by the approach to maintenance. • Mapleton's experience with mechanical and electrical failures has seen a low probability of such risks coming to fruition (particularly due to the mitigation steps in system design like back-ups). • Mapleton also indicated that impacts are not high (e.g., this risk might require a flusher truck getting involved at a cost of $500-$1,000). Assumed this could occur 3-4 times per year over 20 years in order to generate impact figures. • Mapleton also suggested these risks would be well understood by the private sector (who would also bear the cost if they occurred under the Concession Model and Concession Model with CIB Financing).
301	Geotechnical risks related to environmental conditions on the site	• Mapleton indicated the probability would be low under all models as long as geotechnical studies have been conducted (which Mapleton indicated they have been doing regularly). • Mapleton also indicated that – if a site is found to have geotechnical/environmental issues via the studies they conduct – the site would simply be relocated. • Impacts see best case involving re-doing the geotechnical study for a new site and associated cost of schedule delay. • Allocation sees this risk retained by Mapleton under the status quo vs. transferred to the private sector under the Concession Model and Concession Model with CIB Financing.
302	Site contamination caused by construction activities	• Mapleton indicated that – regardless of the model – the probability, impact, and allocation will be the same. • Mapleton noted that the probability of this risk occurring is very low as there are many checks and balances in place to prevent it.

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Risk #	Risk	Notes
401	Operating performance/water quality/delivery according to specifications	• Mapleton noted that OCWA is an experienced operator, given their extensive experience with both Mapleton's networks and other networks across the Province. • Similarly, the private operators shortlisted via the RFQ process have extensive operational experience with water and wastewater networks. • Therefore, probability and impact associated with this risk is very low. • Mapleton indicated that – regardless of delivery model – the cost of this risk is always borne by Mapleton since the Township (Mayor and CAO) are legally responsible for the network.
402	Water or wastewater transmission	• Mapleton indicated that leaks and pipe breaks are unlikely since the Township's system is set deeper than many others (i.e., 4 feet below the ground). In their experience in the past 2 years, there have not been any breaks (e.g., due to factors like frost). This means the probability and impacts under all models are low. • Allocation is 100% public in case of status quo and 100% private in the case of both the Concession Model and Concession Model with CIB Financing.
403	Higher than expected operating costs (including inflation risk)	• Mapleton deemed the probability to be higher under the status quo as compared with the Concession Model and Concession Model with CIB Financing models since the latter would be able to exert greater buyer power over labour (which was presumed to be the biggest driver of operating costs). • Impact figures were deemed the same under all models and were derived by looking at historical data in Canada regarding low/typical/high wage growth inflation. • Status quo sees this risk borne entirely by Mapleton, whereas the Concession Model and Concession Model with CIB Financing models see 50%/50% sharing (given the risk of Mapleton – in their role as regulator – declining to approve costs they deem inappropriate).
501	Rehabilitation works	• Mapleton indicated that the probability is significantly higher under status quo as compared with the other models. • For the status quo model, Mapleton indicated the delay associated with rehabilitation works is 0 months/2 months/10 months for the 10th/Typical/90th scenarios. • For the Concession Model and Concession Model with CIB Financing models, the delay is 0 months/1 month/4 months for the 10th/Typical/90th scenarios. This is approximately half that of the status quo. • Status quo is allocated 100% to Mapleton vs. 50%/50% split for the Concession Model and Concession Model with CIB Financing models (given the risk of Mapleton – in their role as regulator – declining to approve costs they deem inappropriate).
502	Higher than expected rehabilitation costs (including inflation risk)	• Mapleton indicated that they have a good track record of delivering rehabilitation projects on budget; hence, the probability of the status quo assumed to be 10%. • However, Mapleton agreed that the profit motive of the private sector under the Concession Model and Concession Model with CIB Financing models justifies a lower probability figure than the status quo. • Mapleton's experience suggests the impacts range from 10%-20% and agreed impacts would likely be about half that under the other models. • Allocation is 100% to Mapleton under status quo vs. 50%/50% split under other models due to risk of Mapleton – in their role as regulator – declining to approve costs they deem inappropriate.
503	Latent defects on existing assets	• PwC noted that the public sponsor usually has to assume the risk of latent defects as bidders often will not accept this risk. Therefore, probability, impact, and allocation the same regardless of model.

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Risk #	Risk	Notes
504	Asset residual	• The Concession Model and Concession Model with CIB Financing are assumed to see project agreement contain detailed handback provisions in order to incentivize consortium to perform regular lifecycle maintenance to the network. Mapleton agreed this would reduce the probability and impact of both models as compared with the status quo. • Handback provisions in project agreement also transfer this risk to the private sector under the Concession Model and Concession Model with CIB Financing. By contrast, Mapleton would assume 100% of this risk under the status quo.
601	Rate setting process	• Mapleton indicated that – under the status quo – the probability of rates failing to cover expenses is very high. This is based on their previous experience, which has seen this be the case. • Mapleton also indicated they are intending for either the Concession Model or Concession Model with CIB Financing to seek to completely recover costs from ratepayers. • PwC noted that – depending on how the project agreement with the Concessionaire is ultimately structured – if the bid provides a cost above the status quo, Mapleton would reserve the right to reject the bid and pursue the status quo. • Mapleton agreed with the impacts based at the low end on not recovering costs fully, worst case being the Concessionaire's equity return being fully wiped out, and a typical of 2.5%. • Status quo sees allocation borne entirely by Mapleton vs. transferred completed under the other models.
602	Billing and collection (i.e., responsibility for administration and customer collection)	• Mapleton's experience of not collecting on bills (i.e., incurring a bad debt expense) is very low under the status quo. This is because the Township can add any uncollected amounts to taxes, bill landlords, seize property, etc. Accordingly, the status quo probability set at 1%.
603	Significant escalation of unplanned and unanticipated increases in rates	• Mapleton indicated there is a high probability of significant escalation of unplanned and unanticipated increases in rates under the status quo, since this is projected to occur in 4 of the next 20 years under the Township's capital plan. This equates to a 20% probability. • Lower probability assumed for the Concession Model and Concession Model with CIB Financing due to risk of Mapleton – in their role as regulator – declining to approve costs they deem inappropriate. • Mapleton suggested the Concessionaire would be better at controlling costs than would the Township be under the status quo, hence lower impact figures for the other models.

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